



LCIE

Rapport d'essai / Test report

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DELIVRE A / ISSUED TO

: TAGSYS RIFD
785 Voie Antiope
Athélia III
13600 LA CIOTAT - FRANCE

Objet / Subject

: Essais de compatibilité électromagnétique conformément aux normes
Electromagnetic compatibility tests according to the standards
FCC CFR 47 Part 15, Subpart B et C.
RSS-GEN / RSS-210

Matériel testé / Apparatus under test :

- Produit / Product : Tunnel lecteur de TAG RFID / *Tunnel RFID TAG reader*
- Marque / Trade mark : TAGSYS RFID
- Constructeur / Manufacturer : TAGSYS RFID
- Type / Model : MEDIO L40+PLAIN TUNNEL 50X50
- N° de série / serial number : G1323002B0+K1320003-L0
- FCC ID : QHKMEDIOL40
- IC : 7562A-MEDIOL40

Date des essais / Test date

: Du 23 au 25 Juillet 2013 / *From July 23rd to 25th, 2013*

Lieu d'essai / Test location

: LCIE SUD-EST
ZI Centr'Alp – 170 rue de Chatagnon
38430 MOIRANS - FRANCE

Test réalisé par / Test performed by : Anthony MERLIN

Ce document comporte / *Composition of document* : 59 pages.

MOIRANS, LE 30 JUILLET 2013 / *JULY 30TH, 2013*

Ecrit par / *Written by*,
Anthony MERLIN

Approuvé par / *Approved by*,
Jacques LORQUIN



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SUMMARY

1. TEST PROGRAM.....	3
2. SYSTEM TEST CONFIGURATION	4
3. RADIATED EMISSION DATA.....	6
4. FUNDAMENTAL FREQUENCY TOLERANCE (15.225E).....	17
5. BAND-EDGE COMPLIANCE §15.209	19
6. OCCUPIED BANDWIDTH	21
7. CONDUCTED EMISSION DATA	23
8. ANNEX 1 (GRAPHS).....	31
9. UNCERTAINTIES CHART.....	59



1. TEST PROGRAM

Standard:

- FCC Part 15, Subpart B (Digital Devices)
- FCC Part 15, Subpart C
- ANSI C63.4 (2003)
- RSS-Gen Issue 3 – Dec 2010
- RSS-210 Issue 8 – Dec 2010

EMISSION TEST	LIMITS			RESULTS (Comments)
Limits for conducted disturbance at mains ports 150kHz-30MHz CFR 47 §15.207	Frequency	Quasi-peak value (dBµV)	Average value (dBµV)	PASS
	150-500kHz	66 to 56	56 to 46	
	0.5-5MHz	56	46	
	5-30MHz	60	50	
Radiated emissions 9kHz-30MHz CFR 47 §15.209 (a) CFR 47 §15.225 RSS-Gen §4.9	Measure at 300m 9kHz-490kHz : 67.6dBµV/m /F(kHz) Measure at 30m 490kHz-1.705MHz : 87.6dBµV/m /F(kHz) 1.705MHz-30MHz : 29.5 dBµV/m			PASS
Radiated emissions 30MHz-25GHz* CFR 47 §15.209 (a) CFR 47 §15.225 RSS-Gen §4.9	Measure at 3m 30MHz-88MHz : 40 dBµV/m 88MHz-216MHz : 43.5 dBµV/m 216MHz-960MHz : 46.0 dBµV/m Above 960MHz : 54.0 dBµV/m			PASS
Fundamental field strength limit CFR 47 §15.225 RSS-210 §A2.6	Operation within the band 13.110-14.010 MHz			PASS
Fundamental frequency tolerance CFR 47 §15.225 RSS-210 §A2.6	Operation within the band 13.110-14.010 MHz			NP***
Band edge compliance CFR 47 §15.225 RSS-210 §A2.6	Operation within the band 13.110-14.010 MHz			PASS
Occupied bandwidth RSS-Gen §4.6.1	No limit			See results
Receiver Spurious Emission** RSS-Gen §4.10	See RSS-Gen §4.10			NA

*§15.33: The highest internal source of a testing device is defined like more the highest frequency generated or used in the testing device or on which the testing device works or agrees.

- If the highest frequency of the internal sources of the testing device is lower than 108 MHz, measurement must be only performed until 1GHz.

- If the highest frequency of the internal sources of the testing device ranges between 108 MHz and 500 MHz, measurement must be only performed until 2GHz.

- If the highest frequency of the internal sources of the testing device ranges between 500 MHz and 1 GHz, measurement must be only performed until 5GHz.

If the highest frequency of the internal sources of the testing device is above 1 GHz, measurement must be only performed until 5 times the highest frequency or 40 GHz, while taking smallest of both.

**Testing covered the receive mode, and receiver spurious emissions are considered to be the same as transmitter.

***Reader already certified, partial test perform to show compliance of antenna Tunnel with MedioL40



2. SYSTEM TEST CONFIGURATION

2.1. JUSTIFICATION

The system was configured for testing in a typical fashion (as a customer would normally use it).

MEDIOL40 reader is already certified following FCC and IC, TAGSYS RFID wants to add new power supplies with Plain tunnel antenna. Test report present partial tests to show compliance of power supplies and new antenna.

2.2. HARDWARE IDENTIFICATION

Equipment under test (EUT):

MEDIO L40+PLAIN TUNNEL 50X50

Serial number: G1323002B0+K1320003-L0
FCC ID: QHKMEDIOL40
IC: 7562A-MEDIOL40

- Internal max frequencies: <108MHz

Power supply:

- 100-240VAC 50/60Hz
- XP Power, VEH40US24, 100-240 47-63Hz 0.93A / 24VDC 1.66A
- VPELECTRONIQUE, A2-50S18R-V, 100-240V 50-60Hz 1.5A / 24VDC 2.08A
- TRACO Power, TBL 060-124, 100-240V 50/60Hz 1.4-0.9A / 24VDC 2.5A
- Schneider Electric, ABL 7RM24025, 100-240V 50/60Hz 1.1-0.6A / 24VDC 2.5A

Input/output:

- 1 x Power supply AC (P+N+E), unshielded cable, length: 1m
- 1 x LAN, shielded cable, length: 3m
- 1 x Power supply 24VDC
- 1 x Synchro, not used not tested
- 1 x USB, shielded cable, length: 1.5m
- 1 x RS-232, unshielded cable, length: 1.5m
- 1 x GPIO, internal cable to tunnel
- 1 x Extension, internal cable to tunnel
- 4 x RF output SMA

Auxiliary equipment used during test:

- 1 x Laptop, LAN communication
- 5 x TAG



2.3. EUT CONFIGURATION

A reading in loop of TAG is performed, with control software from laptop.

Output power parameter: 2W
Multiplexer: ON
Tunnel Feedback: ON

Software: **TAGSYS Explorer v1.6.0.27291**

ISO 15693

Parameters | Information and State | Memory | Custom

Uplink (Device to Tag)

Command modulation depth: 10% (ASK) [v]
EOF modulation depth: 10% (ASK) [v]
Data coding mode: 1 of 256 [v]

Downlink (Tag to Device)

Number of subcarriers: 1 subcarrier [v]
Data rate: Fast [v]

Memory Mapping (Vicc)

Block length: 4 [v] Number of blocks: 28 [v]

Application Family Identifier (AFI)

☐ Use AFI AFI value: 0 [v]

Default Read

Number of time slots: 16 [v]
☐ Quiet tags once read

Advanced

☐ Set write option flag
☐ Set protocol extension flag

Configuration n°1	XP Power
Configuration n°2	TRACO Power + Schaffner Filter FN2310X-3-06 + Ferrite WE74271111 (2ways-DC output)
Configuration n°3	Schneider electric + Schaffner Filter FN2310X-3-06
Configuration n°4	VPElectronique + Schaffner Filter FN2310X-3-06

2.4. EQUIPMENT MODIFICATIONS

None

2.5. SPECIAL ACCESSORIES

None

3. RADIATED EMISSION DATA

3.1. TEST CONDITIONS

Date of test : July 24th, 2013
Test performed by : A.MERLIN
Atmospheric pressure : 1004mb
Relative humidity : 41%
Ambient temperature : 24°C

3.2. TEST SETUP

The installation of EUT is identical for pre-characterization measurement in a 3 meters semi anechoic chamber and for measures on a 10 meters Open site.

Configuration n°1





Configuration n°2



Configuration n°3



Configuration n°4



Radiated emission test setup



3.3. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE
Antenna Bi-log	CHASE	CBL6111A	C2040051
Antenna Loop	ELECTRO-METRICS	EM-6879	C2040052
Antenna Bi-Log	AH System	SAS-521-7	C2040180
Cable	SUCOFLEX	106G	A5329061
Cable	-	-	A5329183
Cable OATS (Mast at 10m)	UTIFLEX	-	A5329188
Cable	-	-	A5329191
Cable OATS (Mast at 10m)	UTIFLEX	-	A5329199
Cable	-	-	A5329590
Semi-Anechoic chamber #1	SIEPEL	-	D3044016
Radiated emission comb generator	BARDET	-	A3169050
OATS	-	-	F2000409
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019
Thermo-hygrometer (PM2)	OREGON	BAR916HG-G	B4206011
Thermo-hygrometer (C1)	OREGON	WMR 80	B4206013
Turntable / Mast controller (OATS)	ETS Lindgren	Model 2066	F2000372
Antenna mast (OATS)	ETS Lindgren	2071-2	F2000392
Turntable (OATS)	ETS Lindgren	Model 2187	F2000403
Turntable chamber (Cage#1)	MATURO GmbH	TT 2.0 SI	F2000406
Antenna mast (Cage#1)	MATURO GmbH	AM 4.0	F2000407
Turntable controller (Cage#1)	MATURO GmbH	Control Unit	F2000408

**3.4. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION**

None

3.5. TEST SEQUENCE AND RESULTS**3.5.1. Pre-characterization at 3 meters [9kHz-30MHz]**

A pre-scan of all the setup has been performed in a 3 meters semi anechoic chamber. The distance between EUT and antenna is 3 meters. For Pre-characterization, the loop antenna was rotated during the test for maximized the emission measurement. Measurement performed on 3 axis of EUT. Frequency band investigated is 9kHz to 30MHz. The pre-characterization graphs are obtained in PEAK detection.

See graph for 9kHz-30MHz band:	Configuration n°1	Emr#1	(See annex 1)
See graph for 9kHz-30MHz band:	Configuration n°2	Emr#4	(See annex 1)
See graph for 9kHz-30MHz band:	Configuration n°3	Emr#7	(See annex 1)
See graph for 9kHz-30MHz band:	Configuration n°4	Emr#10	(See annex 1)

3.5.2. Pre-characterization [30MHz-1GHz]

For frequency band 30MHz to 1GHz, a pre-scan of all the setup has been performed in a 3 meters semi anechoic chamber. The distance between EUT and antenna is 3 meters. Test is performed in horizontal (H) and vertical (V) polarization with a log-periodic antenna. The EUT is being rotated on 360° and on 3 axis during the measurement. The pre-characterization graphs are obtained in PEAK detection.

See graphs for 30MHz-1GHz:

H polarization	Configuration n°1	Emr#2	(See annex 1)
V polarization	Configuration n°1	Emr#3	(See annex 1)
H polarization	Configuration n°2	Emr#5	(See annex 1)
V polarization	Configuration n°2	Emr#6	(See annex 1)
H polarization	Configuration n°3	Emr#8	(See annex 1)
V polarization	Configuration n°3	Emr#9	(See annex 1)
H polarization	Configuration n°4	Emr#11	(See annex 1)
V polarization	Configuration n°4	Emr#12	(See annex 1)



3.5.3. Characterization on 10 meters open site below 30 MHz

The product has been tested according to ANSI C63.4 (2003), FCC part 15 subpart C. Radiated Emissions were measured on an open area test site. A description of the facility is on file with the FCC. The product has been tested at a distance of **10 meters** from the antenna and compared to the FCC part 15 subpart C §15.225 limits in the frequency range 13.553MHz 13.567MHz. Measurement bandwidth was 9kHz. Antenna height was 1m for both horizontal and vertical polarization. Antenna was rotated around its vertical axis. Continuous linear turntable azimuth search was performed with 360 degrees range. Measurement performed on 3 axis of EUT. A summary of the worst case emissions found in all test configurations and modes is shown on clauses 3.2.

Same results with 4 configurations

Frequency (MHz)	QPeak Limit (dBμV/m) @ 30m	Qpeak (dBμV)	Qpeak (dBμV/m)	Qpeak-Limit (Margin dB)	Turntable Angle (deg)	Ant. Pol./ Angle (deg)	Tot Corr (dB)
13.56 ^{*1}	84.0	32.6	48.8	-35.2	200	90	35.3

^{*1}: Measure have been done at 10m distance and corrected according to requirements of 15.209.e) (M@30m = M@10m-19.1dB)

Limits Sub clause §15.225

Frequency (MHz)	Field strength (μV/m)	Measurement distance (m)
13.553-13.567	15 848 84 dBμV/m	30
13.410-13.553 13.567-13.710	334 50.5 dBμV/m	30
13.110-13.410 13.710-14.010	106 40.5 dBμV/m	30

See chapter 5 of this test report for band edge measurements.



3.5.4. Characterization on 3 meters open site from 30MHz to 1GHz

The product has been tested at a distance of **3 meters** from the antenna and compared to the FCC part 15 subpart B §15.109 limits and C §15.209 limits. Measurement bandwidth was 120kHz from 30 MHz to 1GHz.

Antenna height search was performed from 1m to 4m for both horizontal and vertical polarization. Continuous linear turntable azimuth search was performed with 360 degrees range. Measurement performed on 3 axis of EUT.

A summary of the worst case emissions found in all test configurations and modes is shown on clause 3.2

Worst case final data result:

Configuration n°1

No	Frequency (MHz)	QPeak Limit (dBµV/m)	Qpeak (dBµV/m)	Qpeak-Limit (Margin, dB)	Angle (deg)	Pol	Hgt (cm)	Tot Corr (dB)	Comments
1	34.080	40.0	32.0	-8.0	330	V	100	18.6	
2	53.596	40.0	33.9	-6.1	245	V	100	9.3	
3	54.239	40.0	28.1	-11.9	280	H	110	9.1	
4	67.800	40.0	27.7	-12.3	90	V	120	8.5	
5	67.800	40.0	27.8	-12.2	110	H	100	8.5	
6	81.359	40.0	31.7	-8.3	280	V	100	10.2	
7	81.359	40.0	24.6	-15.4	110	H	100	10.2	
8	108.479	43.5	36.9	-6.6	110	H	100	14.0	
9	122.039	43.5	33.5	-10.0	280	H	110	14.9	
10	122.039	43.5	30.5	-13.0	270	V	100	14.9	
11	135.598	43.5	36.3	-7.2	160	H	130	15.2	
12	135.598	43.5	28.2	-15.3	175	V	100	15.2	
13	162.718	43.5	32.4	-11.1	120	H	100	13.7	
14	176.278	43.5	35.1	-8.4	265	H	100	12.7	
15	189.838	43.5	34.8	-8.7	110	H	100	12.3	
16	189.838	43.5	34.3	-9.2	120	V	100	12.3	
17	203.398	43.5	28.9	-14.6	110	H	110	12.5	
18	244.078	46.0	25.5	-20.5	270	V	100	15.2	
19	325.436	46.0	31.6	-14.4	185	V	150	17.8	
20	352.556	46.0	30.7	-15.3	290	H	180	18.7	
21	366.116	46.0	34.3	-11.7	280	V	100	19.8	

Configuration n°2

No	Frequency (MHz)	QPeak Limit (dBµV/m)	Qpeak (dBµV/m)	Qpeak-Limit (Margin, dB)	Angle (deg)	Pol	Hgt (cm)	Tot Corr (dB)	Comments
1	54.025	40.0	34.5	-5.5	225	V	100	9.2	
2	54.045	40.0	37.6	-2.4	0	H	360	9.2	
3	67.800	40.0	34.9	-5.1	190	H	225	8.5	
4	70.353	40.0	28.3	-11.7	180	H	345	8.7	
5	73.707	40.0	23.9	-16.1	195	H	220	9.0	
6	81.360	40.0	36.2	-3.8	200	H	130	10.2	
7	81.360	40.0	36.5	-3.5	120	V	130	10.2	
8	112.267	43.5	27.5	-16.0	0	V	100	14.3	
9	128.141	43.5	22.4	-21.1	0	V	110	15.1	
10	122.038	43.5	36.9	-6.6	115	H	140	14.9	
11	127.818	43.5	20.4	-23.1	355	H	200	15.1	
12	135.597	43.5	37.2	-6.3	90	H	180	15.2	
13	174.483	43.5	17.1	-26.4	85	H	250	12.8	
14	189.837	43.5	40.3	-3.2	270	V	200	12.3	
15	227.360	46.0	23.5	-22.5	10	H	180	13.5	



Configuration n°3

No	Frequency (MHz)	QPeak Limit (dBµV/m)	Qpeak (dBµV/m)	Qpeak-Limit (Margin, dB)	Angle (deg)	Pol	Hgt (cm)	Tot Corr (dB)	Comments
1	67.800	40.0	32.8	-7.2	180	H	300	8.5	
2	81.360	40.0	33.2	-6.8	280	V	130	10.2	
3	122.038	43.5	31.9	-11.6	280	V	100	14.9	
4	122.038	43.5	33.9	-9.6	110	H	230	14.9	
5	135.596	43.5	39.0	-4.5	90	H	130	15.2	
6	162.716	43.5	31.5	-12.0	90	H	130	13.7	
7	176.276	43.5	38.0	-5.5	280	H	110	12.7	
8	189.836	43.5	35.7	-7.8	245	V	100	12.3	
9	203.396	43.5	30.7	-12.8	280	H	110	12.5	
10	244.076	46.0	31.6	-14.4	210	H	100	15.2	
11	325.436	46.0	30.9	-15.1	110	V	100	17.8	
12	366.116	46.0	33.5	-12.5	280	V	110	19.2	

Configuration n°4

No	Frequency (MHz)	QPeak Limit (dBµV/m)	Qpeak (dBµV/m)	Qpeak-Limit (Margin, dB)	Angle (deg)	Pol	Hgt (cm)	Tot Corr (dB)	Comments
1	35.474	40.0	33.2	-6.8	30	H	100	17.8	
2	67.798	40.0	30.5	-9.5	280	H	100	8.5	
3	81.358	40.0	32.4	-7.6	280	V	100	10.2	
4	81.358	40.0	32.5	-7.5	280	V	100	10.2	
5	108.478	43.5	36.7	-6.8	270	H	110	14.0	
6	122.038	43.5	31.1	-12.4	270	H	110	14.9	
7	122.038	43.5	31.4	-12.1	280	V	100	14.9	
8	135.598	43.5	36.2	-7.3	265	H	100	15.2	
9	176.278	43.5	34.7	-8.8	270	H	110	12.7	
10	189.838	43.5	28.3	-15.2	280	V	110	12.3	
11	352.556	46.0	28.3	-17.7	265	H	200	18.7	
12	420.356	46.0	25.7	-20.3	285	H	130	21.2	

RESULTS: PASS



3.6. FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follow:

$$FS = RA + AF + CF - AG$$

Where FS = Field Strength
 RA = Receiver Amplitude
 AF = Antenna Factor
 CF = Cable Factor
 AG = Amplifier Gain

Assume a receiver reading of 52.5dB μ V is obtained. The antenna factor of 7.4 and a cable factor of 1.1 are added. The amplifier gain of 29dB is subtracted, giving a field strength of 32 dB μ V/m.

$$FS = 52.5 + 7.4 + 1.1 - 29 = 32 \text{ dB}\mu\text{V/m}$$

The 32 dB μ V/m value can be mathematically converted to its corresponding level in μ V/m.

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(32\text{dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}.$$

4. FUNDAMENTAL FREQUENCY TOLERANCE (15.225E)

4.1. TEST CONDITIONS

Date of test : July 24th, 2013
Test performed by : A.MERLIN

4.1. TEMPERATURE AND VOLTAGE FLUCTUATION

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency when the temperature is varied from -20°C to $+50^{\circ}\text{C}$ at the nominal power voltage and the DC power voltage is varied from 17VDC to 27VDC of the rated supply voltage at 20°C . (Worst case)

4.2. TEST SETUP

Temperature has been set at $+20^{\circ}\text{C}$, -20°C and $+50^{\circ}\text{C}$.

Voltage is varied from 17VDC to 27VDC, worst case,

Frequency of carrier: 13.56 MHz

Upper limit: 13.561356 MHz

Lower limit: 13.558644 MHz

The equipment (RF box) is set in a climatic chamber. Measure is performed on one channel of RF module.





4.1. TEST SEQUENCE AND RESULTS

Temperature	-30°C	-20°C	20°C	+50°C
Voltage				
Mains voltage: 24VDC				
Frequency Drift (MHz)	- 0.000099	- 0.000067	13.559886	- 0.000039
Carrier level (dBc)	+ 0.40	+ 0.40	7.600000	- 0.10
Mains voltage: 18VDC				
Frequency Drift (MHz)	- 0.000099	- 0.000066	+ 0.000000	- 0.000039
Carrier level (dBc)	+ 0.40	+ 0.40	- 0.05	- 0.10
Mains voltage: 27VDC				
Frequency Drift (MHz)	- 0.000099	- 0.000064	- 0.000001	- 0.000039
Carrier level (dBc)	+ 0.40	+ 0.40	+ 0.00	- 0.10

Frequency drift measured is **99 Hz** when the temperature is varied from -30°C to +50°C and voltage is varied.

4.2. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE
Attenuator 14dB	RADIALL	-	A7122163
Cable SMA	-	-	A5329580
Climatic chamber	BIA CLIMATIC	CL 6-25	D1022117
Data Logger	AGILENT	34970A	A6440083
Data Logger card	AGILENT	34970A	A6449036
Frequency Counter	HEWLETT PACKARD	HP 5350B	B2082009
Multimeter	FLUKE	189	A1240171
Power supply DC	AFX	0	A7044292
Receiver 9kHz - 6GHz	ROHDE & SCHWARZ	FSL6	A2642020

4.3. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

**5. BAND-EDGE COMPLIANCE §15.209****5.1. TEST CONDITIONS**

Date of test : July 24th, 2013
Test performed by : A.MERLIN
Atmospheric pressure : 1004mb
Relative humidity : 41%
Ambient temperature : 24°C

5.2. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE
Antenna Loop	ELECTRO-METRICS	EM-6879	C2040052
Antenna Bi-Log	AH System	SAS-521-7	C2040180
Cable	-	-	A5329183
Cable	-	-	A5329590
Semi-Anechoic chamber #1	SIEPEL	-	D3044016
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019
Thermo-hygrometer (PM2)	OREGON	BAR916HG-G	B4206011
Thermo-hygrometer (C1)	OREGON	WMR 80	B4206013
Turntable chamber (Cage#1)	MATURO Gmbh	TT 2.0 SI	F2000406
Antenna mast (Cage#1)	MATURO Gmbh	AM 4.0	F2000407
Turntable controller (Cage#1)	MATURO Gmbh	Control Unit	F2000408

5.3. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

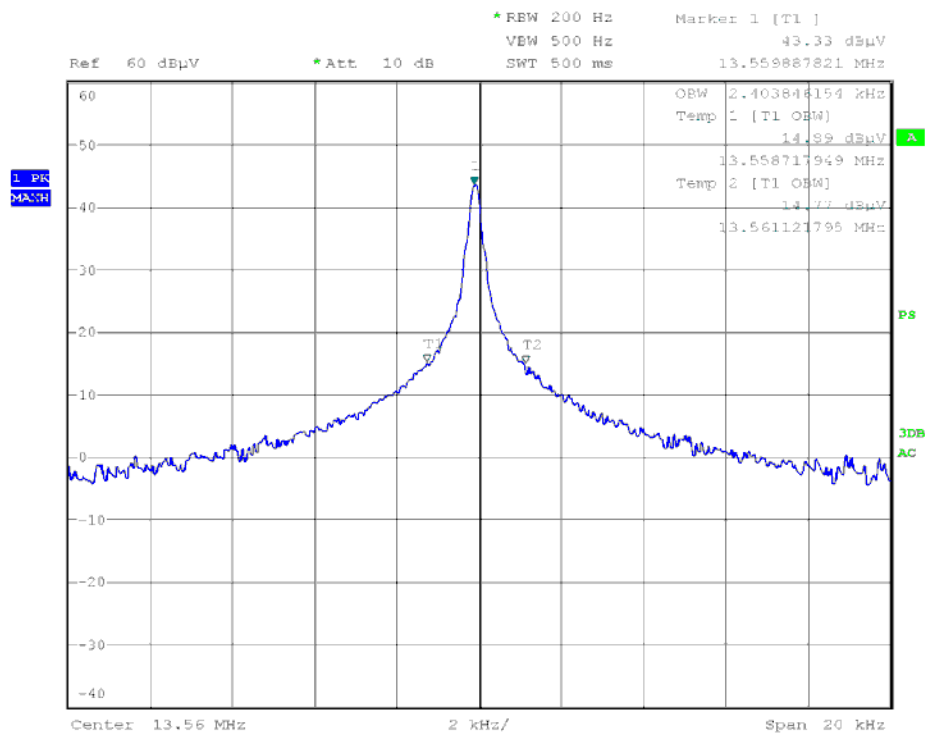
None

6. OCCUPIED BANDWIDTH

6.1. CLIMATIC CONDITIONS

Date of test : July 24th, 2013
 Test performed by : A.MERLIN
 Atmospheric pressure : 1004mb
 Relative humidity : 41%
 Ambient temperature : 24°C

6.2. TEST RESULTS



Measured occupied bandwidth is **2.4 kHz**

Measurement settings:

RBW = 200Hz / Video BW = 500Hz / SPAN = 20kHz / PEAK / Maxhold / OBW function

The occupied bandwidth is measured with OBW function of spectrum analyzer.

**6.3. TEST EQUIPMENT LIST**

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE
Antenna Loop	ELECTRO-METRICS	EM-6879	C2040052
Antenna Bi-Log	AH System	SAS-521-7	C2040180
Cable	-	-	A5329183
Cable	-	-	A5329590
Semi-Anechoic chamber #1	SIEPEL	-	D3044016
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019
Thermo-hygrometer (PM2)	OREGON	BAR916HG-G	B4206011
Thermo-hygrometer (C1)	OREGON	WMR 80	B4206013
Turntable chamber (Cage#1)	MATURO Gmbh	TT 2.0 SI	F2000406
Antenna mast (Cage#1)	MATURO Gmbh	AM 4.0	F2000407
Turntable controller (Cage#1)	MATURO Gmbh	Control Unit	F2000408

6.4. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

7. CONDUCTED EMISSION DATA

7.1. TEST CONDITIONS

Date of test : July 23rd, 2013
Test performed by : A.MERLIN
Atmospheric pressure : 1000mb
Relative humidity : 35%
Ambient temperature : 25°C

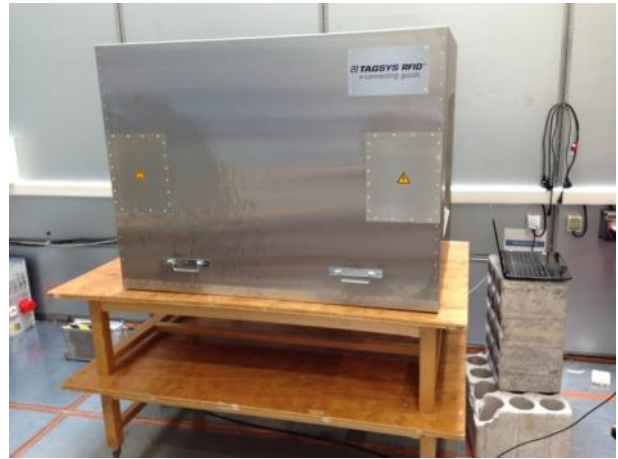
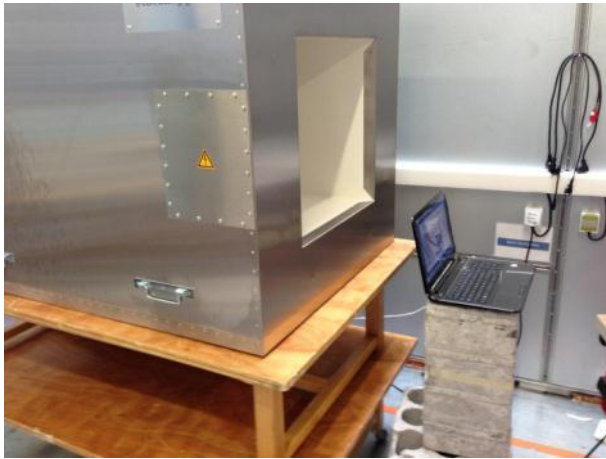
7.2. SETUP FOR CONDUCTED EMISSIONS MEASUREMENT

The product has been tested according to ANSI C63.4-(2003) and FCC Part 15 subpart B and C. The product has been tested with 120V/60Hz power line voltage and compared to the FCC Part 15 subpart B §15.107 and C §15.207 limits. Measurement bandwidth was 9kHz from 150kHz to 30MHz. Measurement is made with a Rohde & Schwarz ESU8 receiver in peak mode. This was followed by a Quasi-Peak, i.e. CISPR measurement for any strong signal. If the average limit is met when using a Quasi-Peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary. The LISN (measure) is 50Ω / $50\mu\text{H}$. The Peak data are shown on plots in annex 1. Quasi-Peak and Average measurements are detailed in a table with frequencies and levels measured. Interconnecting cables and equipment's were moved to position that maximized emission. A summary of the worst case emissions found in all test configurations and modes is shown on the following page.

The EUT is placed on the ground reference plane, at 80cm from the LISN. The distance between the EUT and the vertical ground plane is 40cm. Auxiliaries are powered by another LISN. The cable has been shorted to 1meter length. The EUT is powered through the LISN (measure).

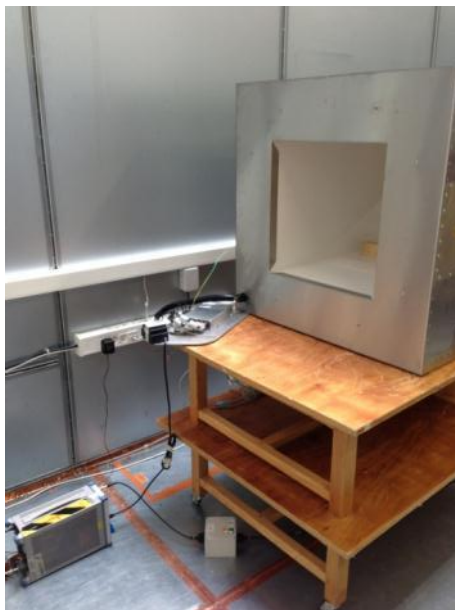
Configuration n°1



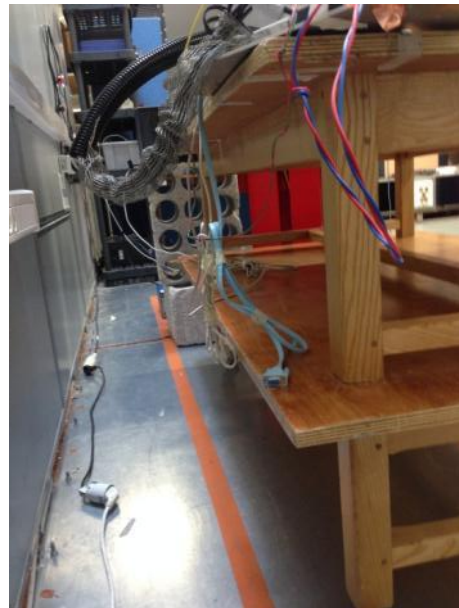




Configuration n°2



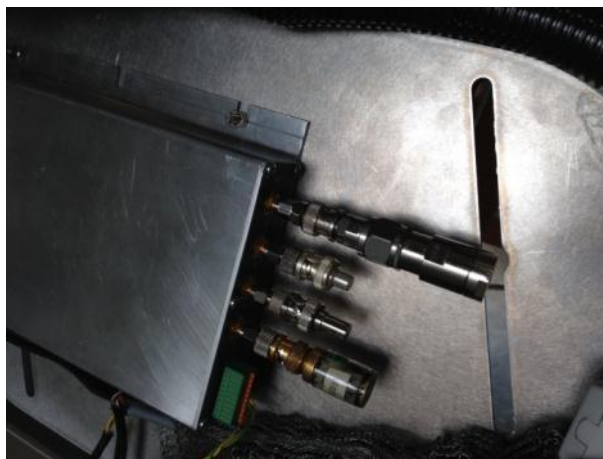
Configuration n°3



Configuration n°4



Conducted emission test setup



Dummy load

7.3. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE
Cable	-	-	A5329585
Conducted emission comb generator	BARDET	-	A3169049
LISN	TELEMETER ELECTRONIC	NNB-2/16Z	C2320061
LISN	RHODE & SCHWARZ	ENV216	C2320123
Receiver 20Hz – 8GHz	ROHDE & SCHWARZ	ESU8	A2642019
Thermo-hygrometer (PM2)	OREGON	BAR916HG-G	B4206011
Transient limiter	RHODE & SCHWARZ	ESH3-Z2	A7122204

7.4. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

**7.5. TEST SEQUENCE AND RESULTS**

Measurements are performed on the phase (L1) and neutral (N) of power line voltage. A measurement is also performed with a 50Ω dummy load replacing the transmitter antenna in order to demonstrate that some 13.56MHz may be cross-coupled to AC line connection. Graphs are obtained in PEAK detection. Measures are also performed in Quasi-Peak and Average for any strong signal.

Configuration n°1

Measure on L1:	graph Emc#1		(see annex 1)
Measure on N:	graph Emc#2		(see annex 1)
Measure on L1:	graph Emc#3	<i>With Dummy Load</i>	(see annex 1)
Measure on N:	graph Emc#4	<i>With Dummy Load</i>	(see annex 1)

Configuration n°2

Measure on L1:	graph Emc#5		(see annex 1)
Measure on N:	graph Emc#6		(see annex 1)
Measure on L1:	graph Emc#7	<i>With Dummy Load</i>	(see annex 1)
Measure on N:	graph Emc#8	<i>With Dummy Load</i>	(see annex 1)

Configuration n°3

Measure on L1:	graph Emc#9		(see annex 1)
Measure on N:	graph Emc#10		(see annex 1)
Measure on L1:	graph Emc#11	<i>With Dummy Load</i>	(see annex 1)
Measure on N:	graph Emc#12	<i>With Dummy Load</i>	(see annex 1)

Configuration n°4

Measure on L1:	graph Emc#13		(see annex 1)
Measure on N:	graph Emc#14		(see annex 1)
Measure on L1:	graph Emc#15	<i>With Dummy Load</i>	(see annex 1)
Measure on N:	graph Emc#16	<i>With Dummy Load</i>	(see annex 1)

RESULT: PASS



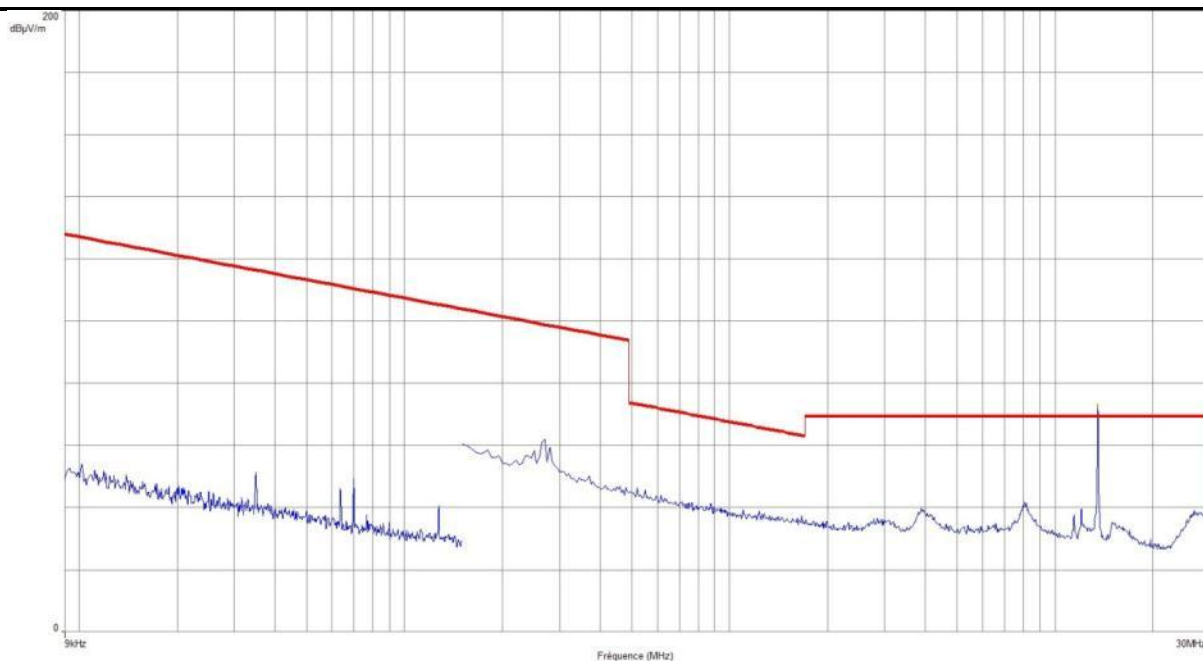
8. ANNEX 1 (GRAPHS)

RADIATED EMISSIONS

Graph name :	Emr#1	Test configuration:
Limit :	FCC Part15C	Tunnel + XP Power
Class :	-	

PARAMETERS

Antenna polarization:	0°	Legend:
Azimuth :	0° - 360°	Peak Measure
RBW :	200Hz / 9kHz	QPeak Limit@3m
VBW :	1kHz / 30kHz	
Frequency :	9kHz - 30MHz	



Frequency (MHz)	Peak (dBμV/m)
13.56	73.01



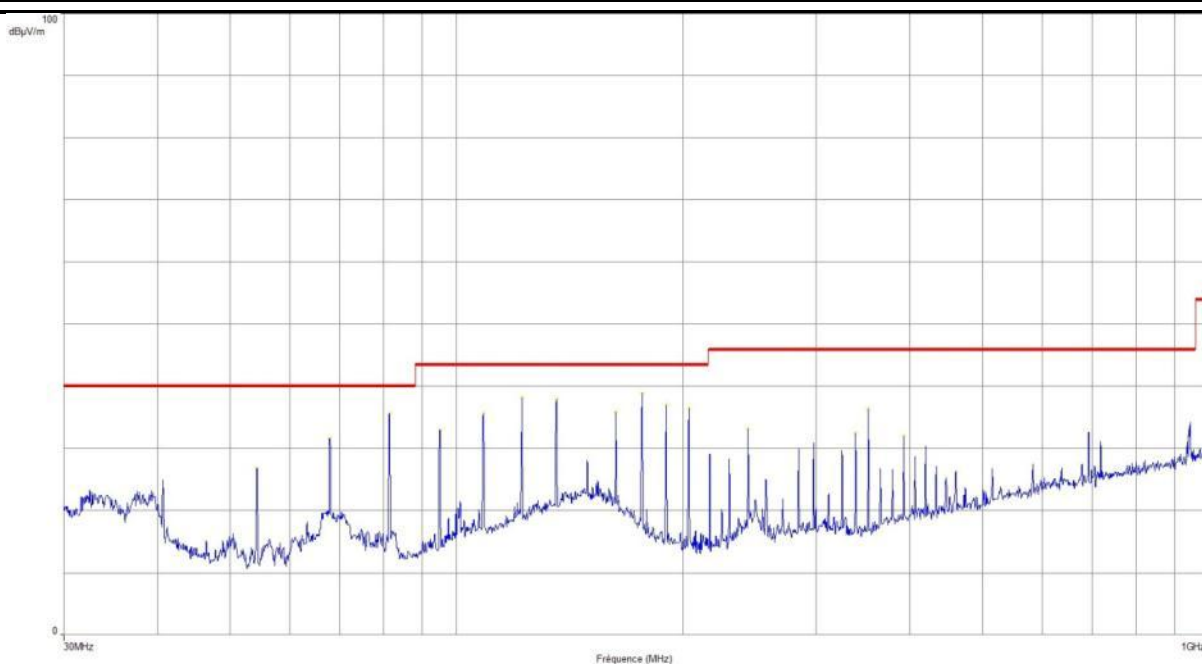
L C I E

RADIATED EMISSIONS

Graph name :	Emr#2	Test configuration:
Limit :	FCC Part15C	Tunnel + XP Power
Class :		

PARAMETERS

Antenna polarization:	Horizontal	Legend:
Azimuth :	0° - 360°	Peak Measure
RBW :	100kHz	
VBW :	300kHz	QPeak Limit@3m
Frequency :	30MHz - 1GHz	



Frequency (MHz)	Peak (dBμV/m)
54.242	26.87
67.791	31.6
81.357	35.67
94.923	33.02
108.472	35.66
122.038	38.16
135.604	38.07
162.736	35.89
176.268	38.86
189.851	36.93
203.36	36.52
244.04	33.21
339	32.51
352.56	36.39
393.24	32.04



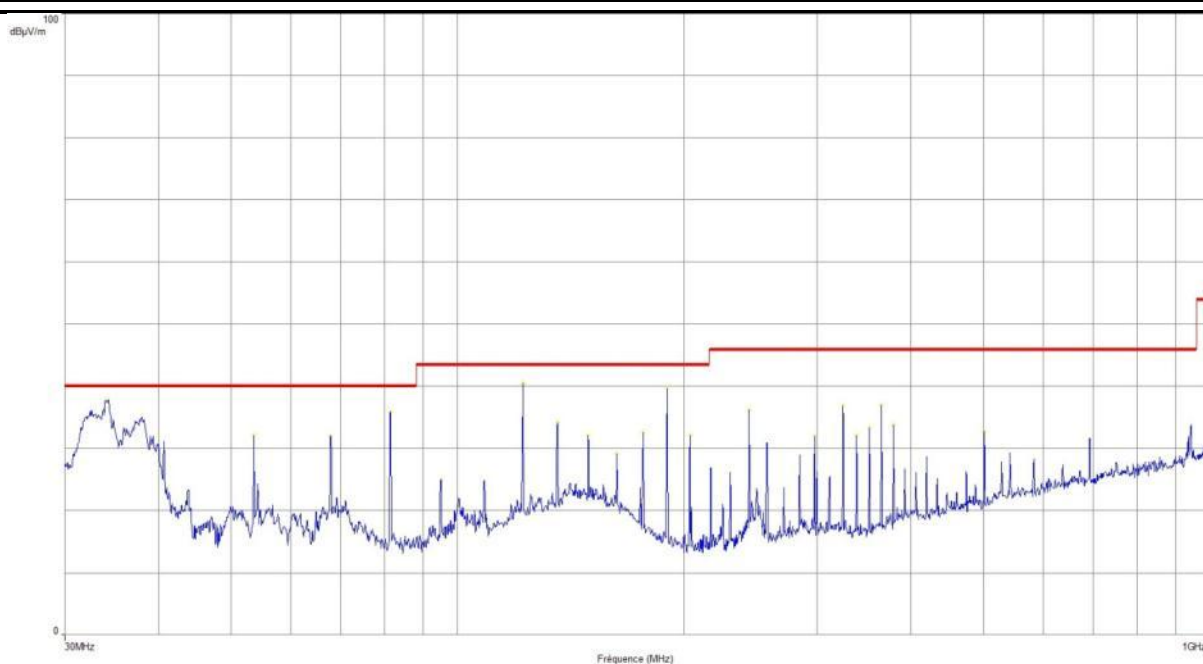
L C I E

RADIATED EMISSIONS

Graph name :	Emr#3	Test configuration:
Limit :	FCC Part15C	Tunnel + XP Power
Class :		

PARAMETERS

Antenna polarization:	Vertical	Legend:
Azimuth :	0° - 360°	Peak Measure
RBW :	100kHz	
VBW :	300kHz	QPeak Limit@3m
Frequency :	30MHz - 1GHz	



Frequency (MHz)	Peak (dBµV/m)
34.08	37.84
53.596	32.1
67.791	32.02
81.357	35.96
122.038	40.54
135.604	34.28
149.153	32.09
162.719	29.13
176.285	32.62
189.834	39.7
203.36	32.16
244.04	36.23
298.32	32
325.44	36.96
339	32.13
352.56	33.35
366.12	36.98
379.68	33.73
501.72	32.75

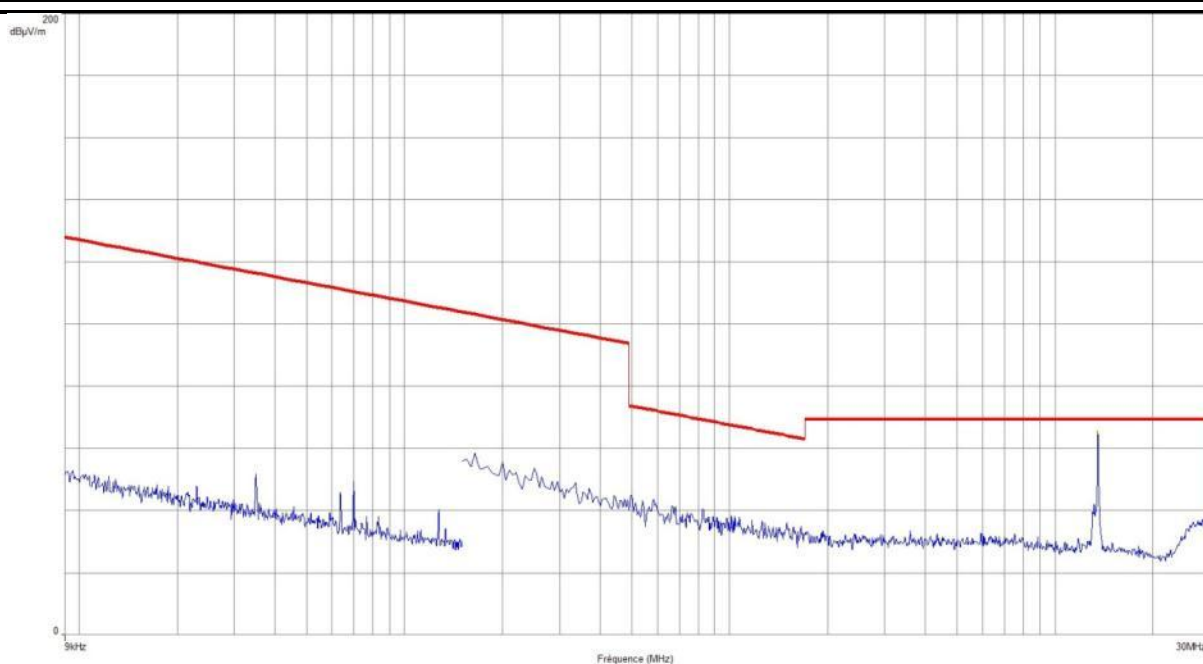


RADIATED EMISSIONS

Graph name :	Emr#4	Test configuration:
Limit :	FCC Part15C	Tunnel + Traco + Filtre
Class :		

PARAMETERS

Antenna polarization:	0°	Legend:
Azimuth :	0° - 360°	Peak Measure
RBW :	200Hz / 9kHz	
VBW :	1kHz / 30kHz	QPeak Limit@3m
Frequency :	9kHz - 30MHz	



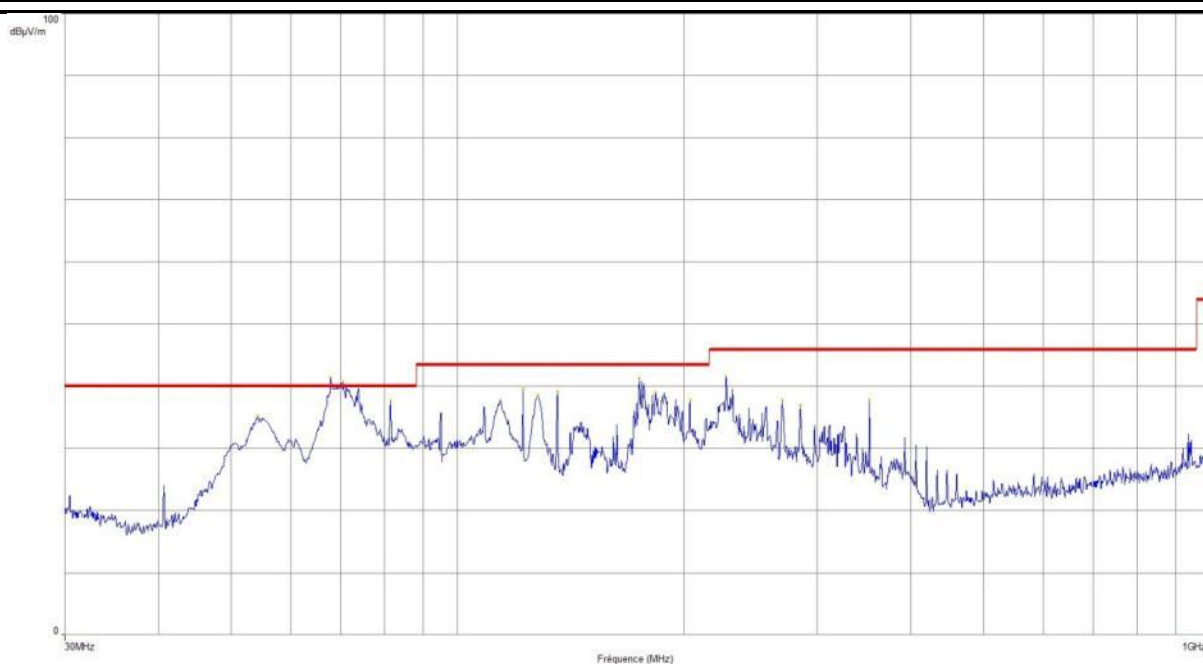
Frequency (MHz)	Peak (dBμV/m)
13.56	65.65

RADIATED EMISSIONS

Graph name :	Emr#5	Test configuration:
Limit :	FCC Part15C	Tunnel + Traco + Filtre
Class :		

PARAMETERS

Antenna polarization:	Horizontal	Legend:
Azimuth :	0° - 360°	 Peak Measure
RBW :	100kHz	 QPeak Limit@3m
VBW :	300kHz	
Frequency :	30MHz - 1GHz	



Frequency (MHz)	Peak (dBμV/m)
54.225	35.32
67.791	41.44
70.443	40.79
73.707	40.11
81.374	37.67
122.055	39.7
127.818	38.61
135.604	39.24
174.483	41.33
183.255	39.08
203.4	37.91
227.36	41.73
270.16	37.78
285.44	36.93
352.56	37.9



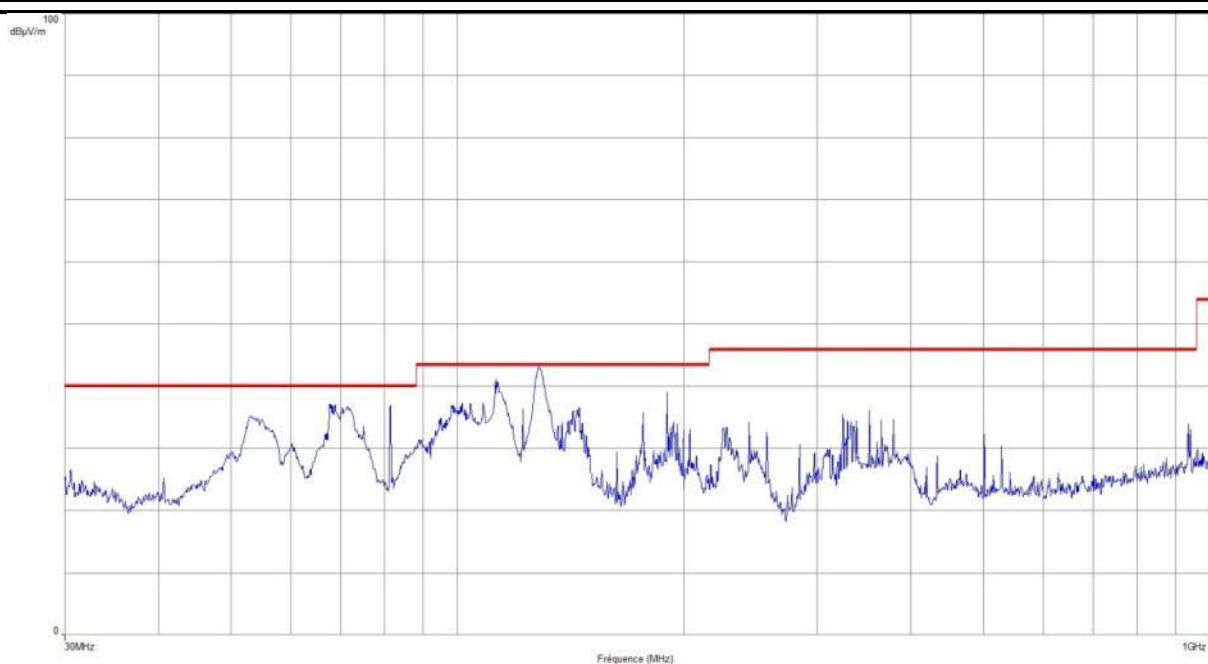
L C I E

RADIATED EMISSIONS

Graph name :	Emr#6	Test configuration:
Limit :	FCC Part15C	Tunnel + Traco + Filtre
Class :		

PARAMETERS

Antenna polarization:	Vertical	Legend:
Azimuth :	0° - 360°	Peak Measure
RBW :	100kHz	
VBW :	300kHz	QPeak Limit@3m
Frequency :	30MHz - 1GHz	



Frequency (MHz)	Peak (dBμV/m)
53.358	35.25
67.621	37.19
81.357	36.96
112.688	41.15
128.141	43.22
145.022	36.63
189.834	39.07
203.36	33.15
244.04	34.19
325.4	35.46
352.52	36.15

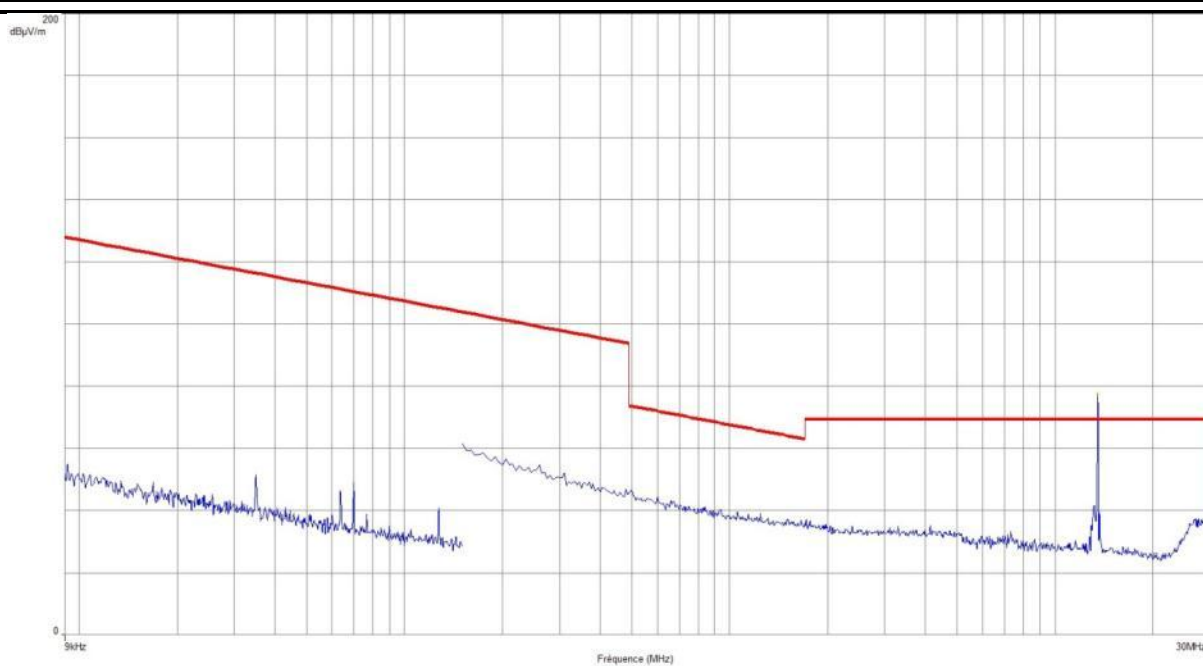


RADIATED EMISSIONS

Graph name :	Emr#7	Test configuration:
Limit :	FCC Part15C	Tunnel + Schneider + Filtre
Class :		

PARAMETERS

Antenna polarization:	0°	Legend:
Azimuth :	0° - 360°	Peak Measure
RBW :	200Hz / 9kHz	QPeak Limit@3m
VBW :	1kHz / 30kHz	
Frequency :	9kHz - 30MHz	



Frequency (MHz)	Peak (dBμV/m)
13.56	77.75



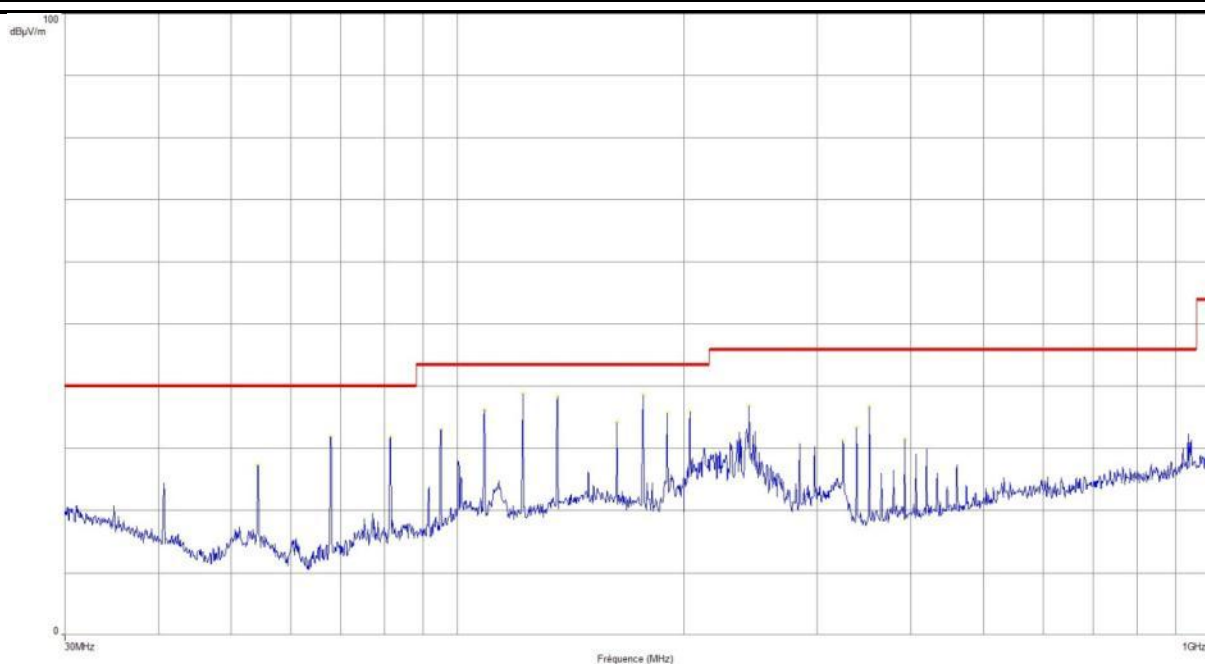
L C I E

RADIATED EMISSIONS

Graph name :	Emr#8	Test configuration:
Limit :	FCC Part15C	Tunnel + Schneider + Filtre
Class :		

PARAMETERS

Antenna polarization:	Horizontal	Legend:
Azimuth :	0° - 360°	Peak Measure
RBW :	100kHz	QPeak Limit@3m
VBW :	300kHz	
Frequency :	30MHz - 1GHz	



Frequency (MHz)	Peak (dBμV/m)
54.242	27.4
67.791	31.84
81.357	31.89
94.906	33.17
108.489	36.23
122.038	38.87
135.604	38.4
162.719	34.28
176.285	38.53
189.834	35.66
203.36	35.87
244.04	36.87
325.4	31.33
339	33.4
352.52	36.7
393.24	31.52

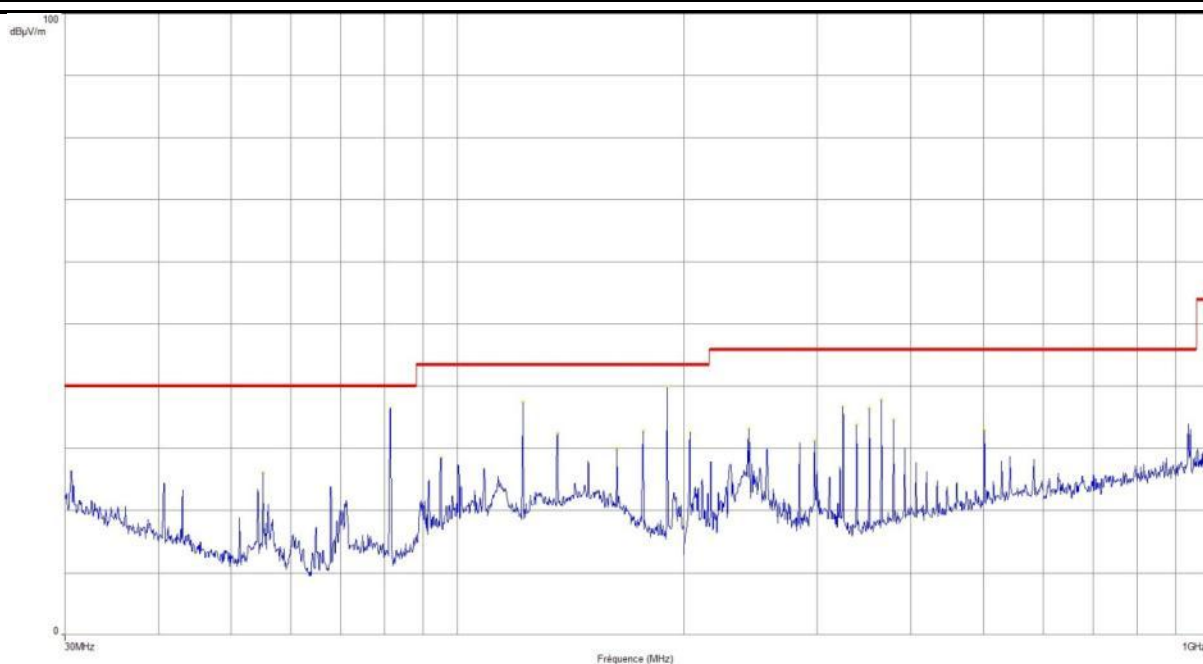


RADIATED EMISSIONS

Graph name :	Emr#9	Test configuration:
Limit :	FCC Part15C	Tunnel + Schneider + Filtre
Class :		

PARAMETERS

Antenna polarization:	Vertical	Legend:
Azimuth :	0° - 360°	Peak Measure
RBW :	100kHz	QPeak Limit@3m
VBW :	300kHz	
Frequency :	30MHz - 1GHz	



Frequency (MHz)	Peak (dBµV/m)
30.612	26.37
55.092	26.02
81.374	36.5
94.906	28.63
122.038	37.47
135.621	32.52
162.736	30.02
176.302	32.83
189.851	39.79
203.36	32.55
242.72	31.51
244.04	33.22
298.32	31.24
325.44	36.76
339	33.84
352.56	36.47
366.12	37.77
379.68	34.68
501.72	32.9

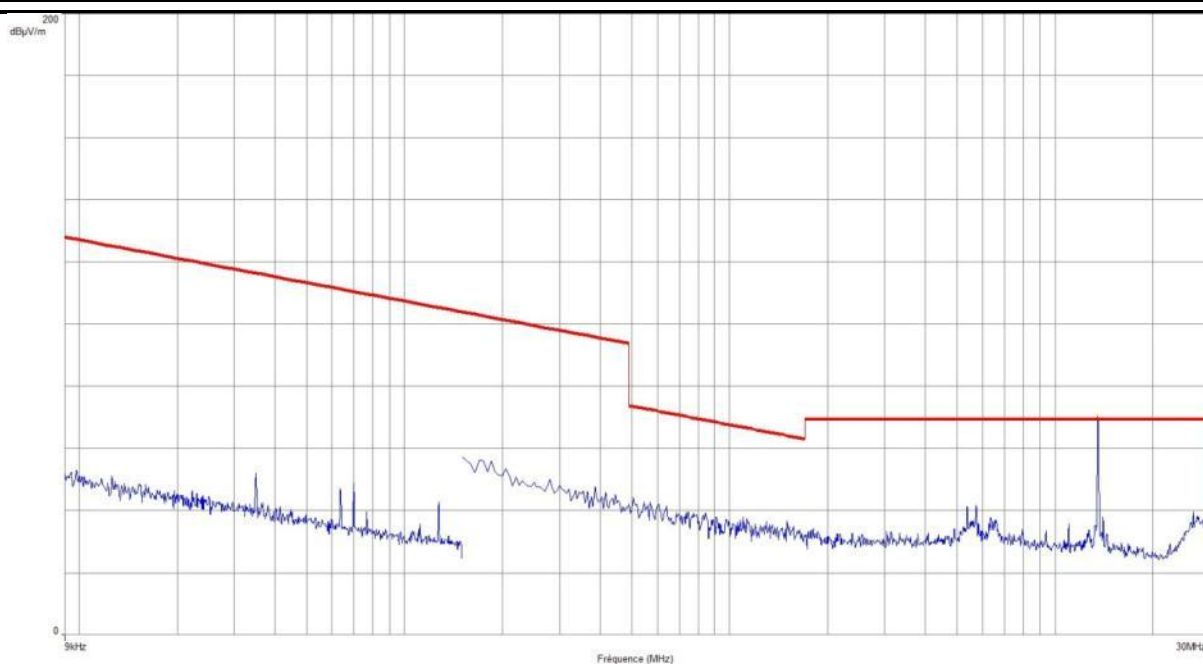


RADIATED EMISSIONS

Graph name :	Emr#10	Test configuration:
Limit :	FCC Part15C	Tunnel + VPE + Filtre
Class :	-	

PARAMETERS

Antenna polarization:	0°	Legend:
Azimuth :	0° - 360°	Peak Measure
RBW :	200Hz / 9kHz	QPeak Limit@3m
VBW :	1kHz / 30kHz	
Frequency :	9kHz - 30MHz	



Frequency (MHz)	Peak (dBμV/m)
13.56	70.4



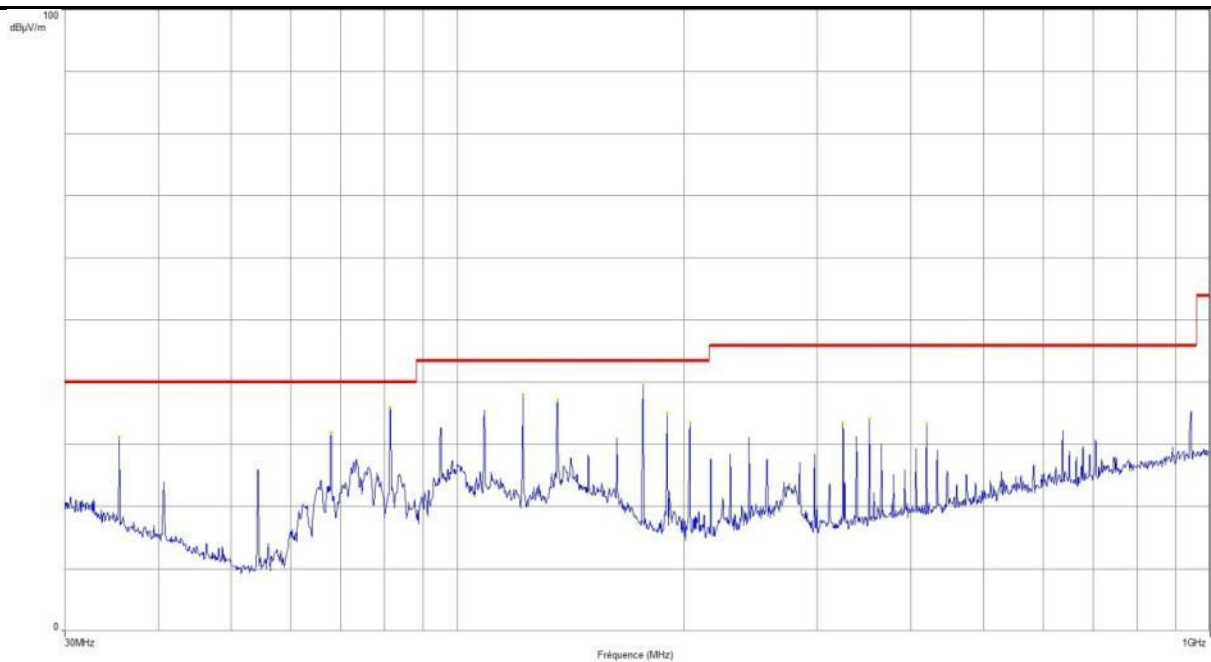
L C I E

RADIATED EMISSIONS

Graph name :	Emr#11	Test configuration:
Limit :	FCC Part15C	Tunnel + VPE + Filtre
Class :	-	

PARAMETERS

Antenna polarization:	Horizontal	Legend:
Azimuth :	0° - 360°	Peak Measure
RBW :	100kHz	
VBW :	300kHz	QPeak Limit@3m
Frequency :	30MHz - 1GHz	



Frequency (MHz)	Peak (dBμV/m)
35.474	31.32
67.825	31.97
81.323	35.96
122.055	37.99
135.604	37.36
176.285	39.69
189.851	35.11
203.36	33.57
325.4	33.57
352.56	34.26
420.32	33.43

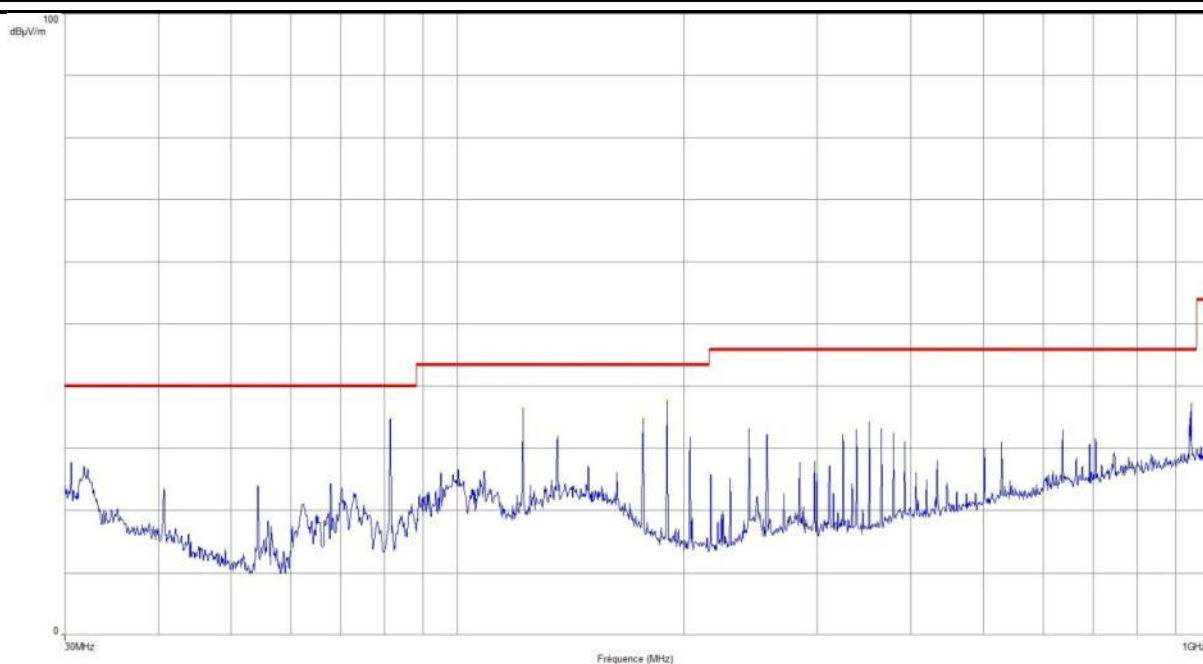


RADIATED EMISSIONS

Graph name :	Emr#12	Test configuration:
Limit :	FCC Part15C	Tunnel + VPE + Filtre
Class :	-	

PARAMETERS

Antenna polarization:	Vertical	Legend:
Azimuth :	0° - 360°	Peak Measure
RBW :	100kHz	
VBW :	300kHz	QPeak Limit@3m
Frequency :	30MHz - 1GHz	

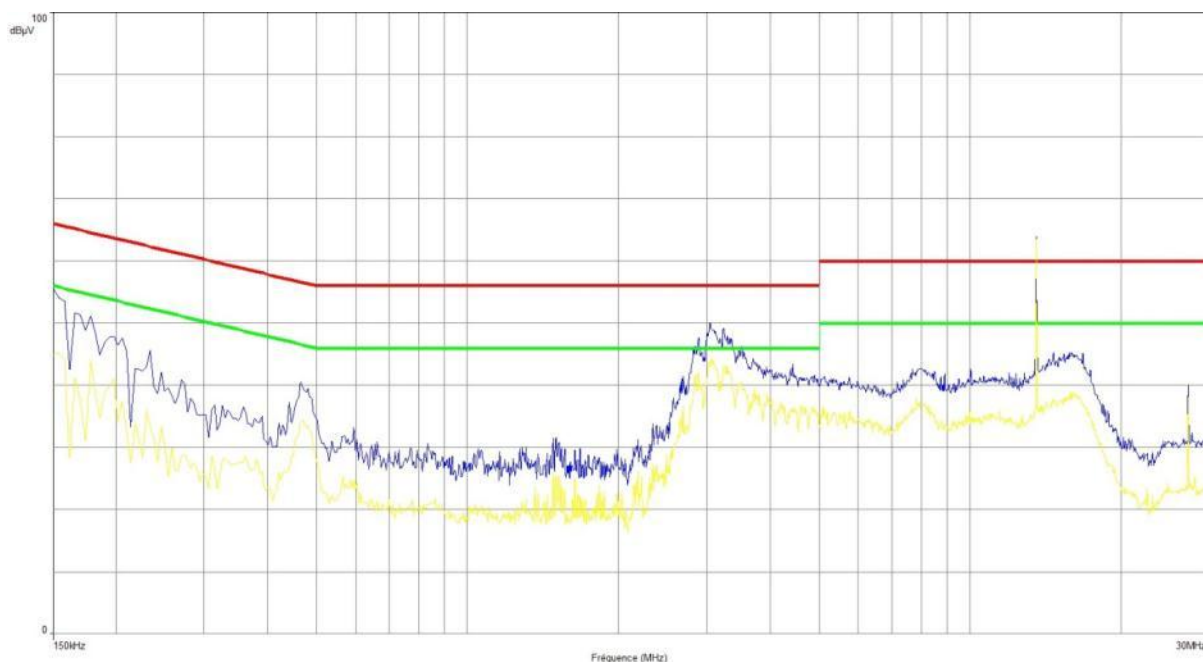


Frequency (MHz)	Peak (dBμV/m)
81.357	34.89
122.055	36.47
176.285	34.8
189.834	37.69
943.16	37.24



CONDUCTED EMISSIONS		
Graph name :	Emc#1	Test configuration:
Limit :	EN 55022	Tunnel - XP Power (P)
Class :	B	

PARAMETERS			
Voltage / Frequency :	110VAC / 60Hz	Legend:	
Line :	Phase	Peak Measure	Average Measure
RBW :	10kHz		
VBW :	30kHz	QPeak Limit	Average Limit
Frequency :	150kHz- 30MHz		



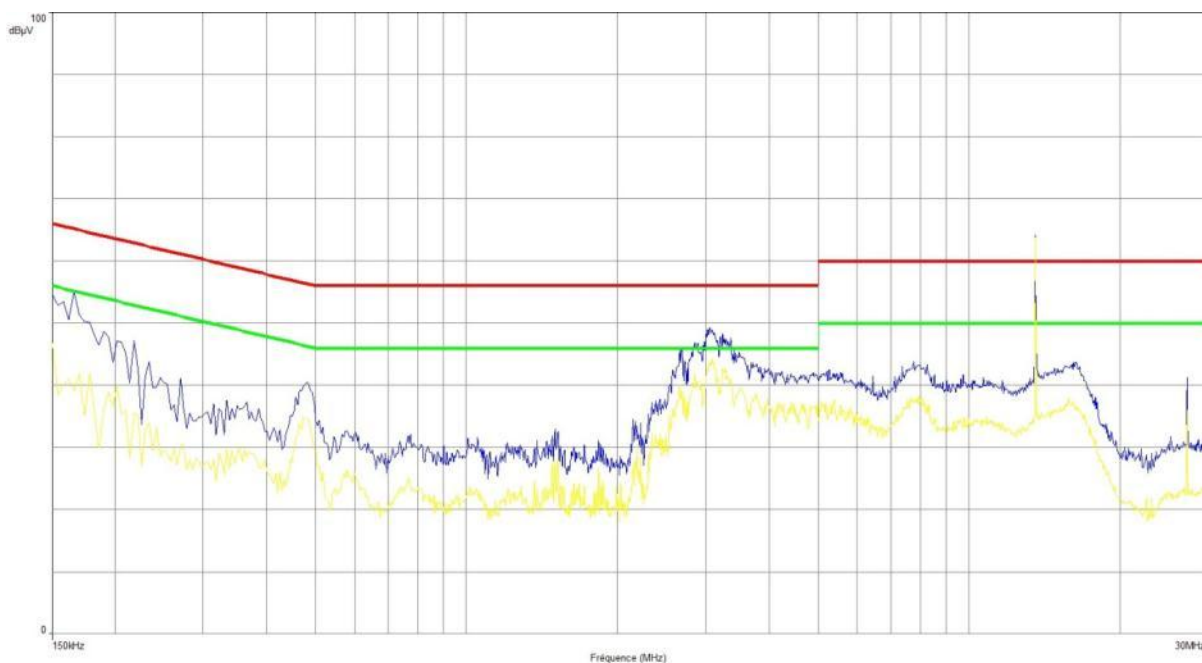
Frequency (MHz)	Avg (dBμV)	Lim Avg (dBμV)	MesAvg - LimAvg (dBμV)	QPeak (dBμV)	Lim QPeak (dBμV)	MesQP - LimQP (dBμV)
3.042	44.71	46	-1.29	46.29	56	-9.71
13.558*	64.65	50	14.65	62.78	60	2.78
27.118	38.49	50	-11.51	37.89	60	-22.11

*carrier frequency, see dummy load test



CONDUCTED EMISSIONS		
Graph name :	Emc#2	Test configuration:
Limit :	EN 55022	Tunnel - XP Power (N)
Class :	B	

PARAMETERS		
Voltage / Frequency :	110VAC / 60Hz	Legend:
Line :	Neutral	Peak Measure
RBW :	10kHz	Average Measure
VBW :	30kHz	QPeak Limit
Frequency :	150kHz- 30MHz	Average Limit



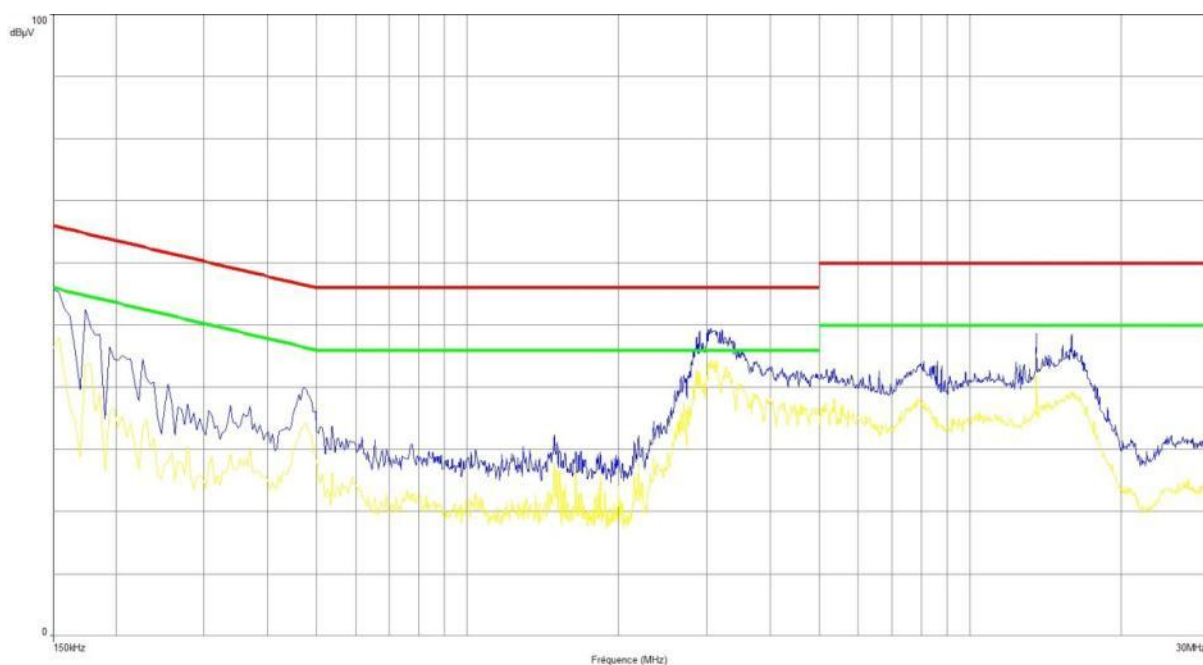
Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	MesAvg - LimAvg (dBµV)	QPeak (dBµV)	Lim QPeak (dBµV)	MesQP - LimQP (dBµV)
3.046	45.39	46	-0.61	45.11	56	-10.89
13.558*	66.19	50	16.19	70.2	60	10.2
27.118	49.69	50	-0.31	48.01	60	-11.99

*carrier frequency, see dummy load test



CONDUCTED EMISSIONS		
Graph name :	Emc#3	Test configuration:
Limit :	EN 55022	Tunnel - XP Power - Dummy load (P)
Class :	B	

PARAMETERS			
Voltage / Frequency :	110VAC / 60Hz	Legend:	
Line :	Phase	Peak Measure	Average Measure
RBW :	10kHz		
VBW :	30kHz	QPeak Limit	Average Limit
Frequency :	150kHz- 30MHz		

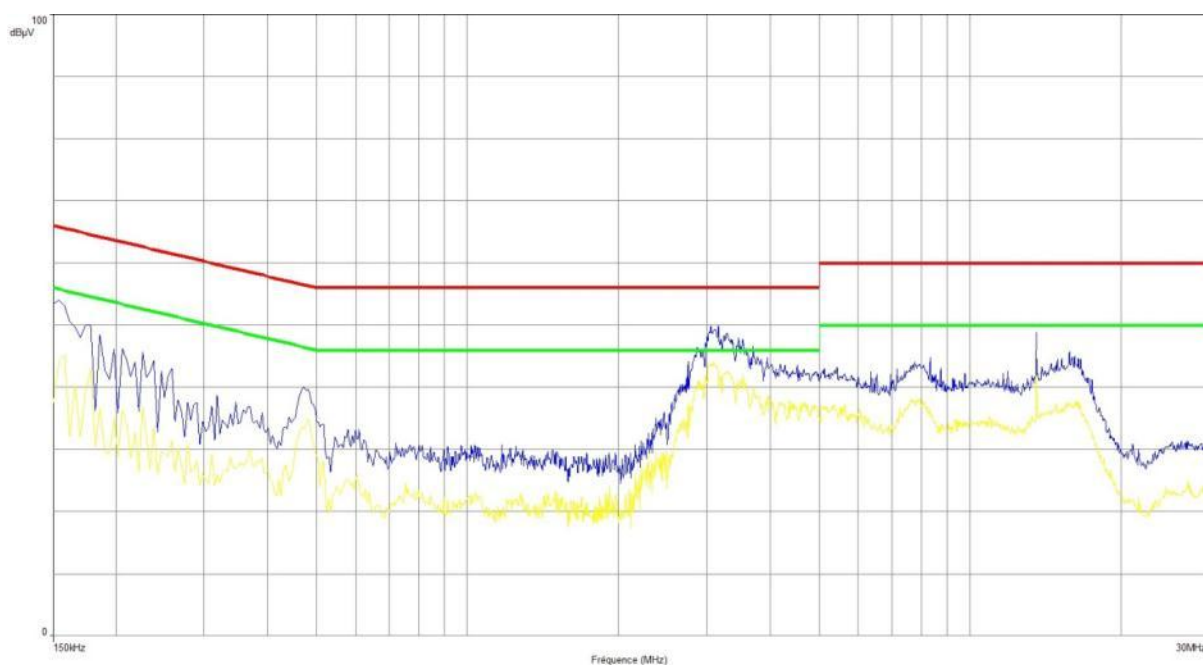


Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	MesAvg - LimAvg (dBµV)	QPeak (dBµV)	Lim QPeak (dBµV)	MesQP - LimQP (dBµV)
13.558	47.63	50	-2.37	47.53	60	-12.47



CONDUCTED EMISSIONS		
Graph name :	Emc#4	Test configuration:
Limit :	EN 55022	Tunnel - XP Power - Dummy load (N)
Class :	B	

PARAMETERS			
Voltage / Frequency :	110VAC / 60Hz	Legend:	
Line :	Neutral	Peak Measure	Average Measure
RBW :	10kHz		
VBW :	30kHz	QPeak Limit	Average Limit
Frequency :	150kHz- 30MHz		

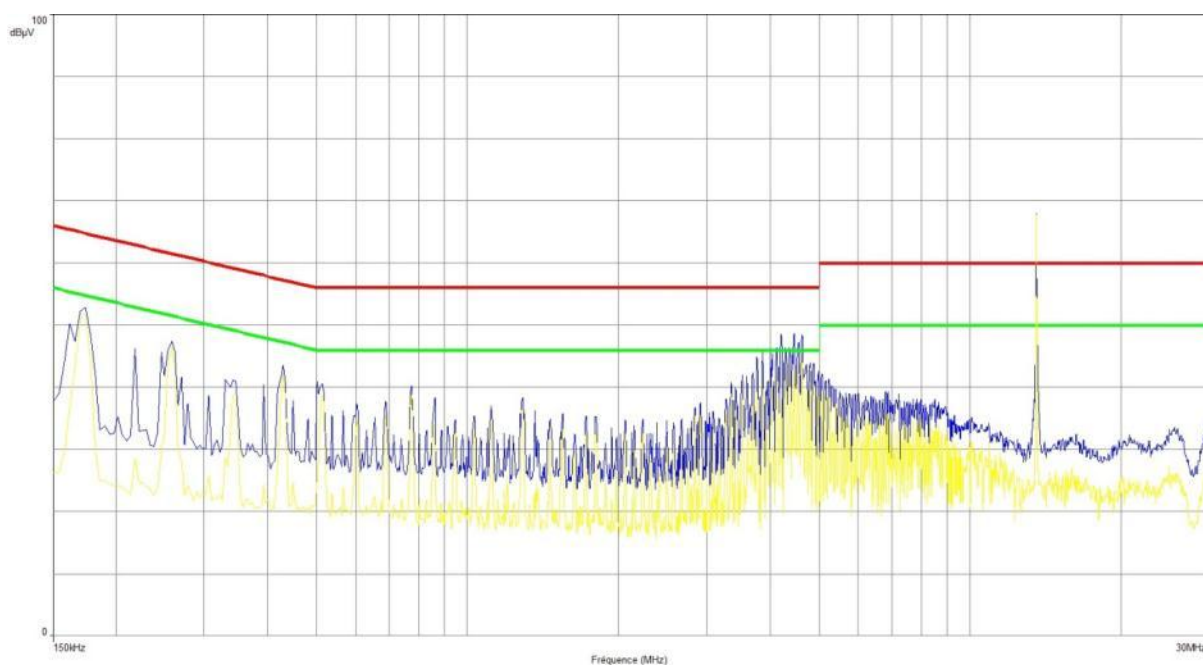


Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	MesAvg - LimAvg (dBµV)	QPeak (dBµV)	Lim QPeak (dBµV)	MesQP - LimQP (dBµV)
13.558	47.19	50	-2.81	47.09	60	-12.91



CONDUCTED EMISSIONS		
Graph name :	Emc#5	Test configuration:
Limit :	EN 55022	Tunnel - Traco (P)
Class :	B	

PARAMETERS			
Voltage / Frequency :	110VAC / 60Hz	Legend:	
Line :	Phase	Peak Measure	Average Measure
RBW :	10kHz		
VBW :	30kHz	QPeak Limit	Average Limit
Frequency :	150kHz- 30MHz		



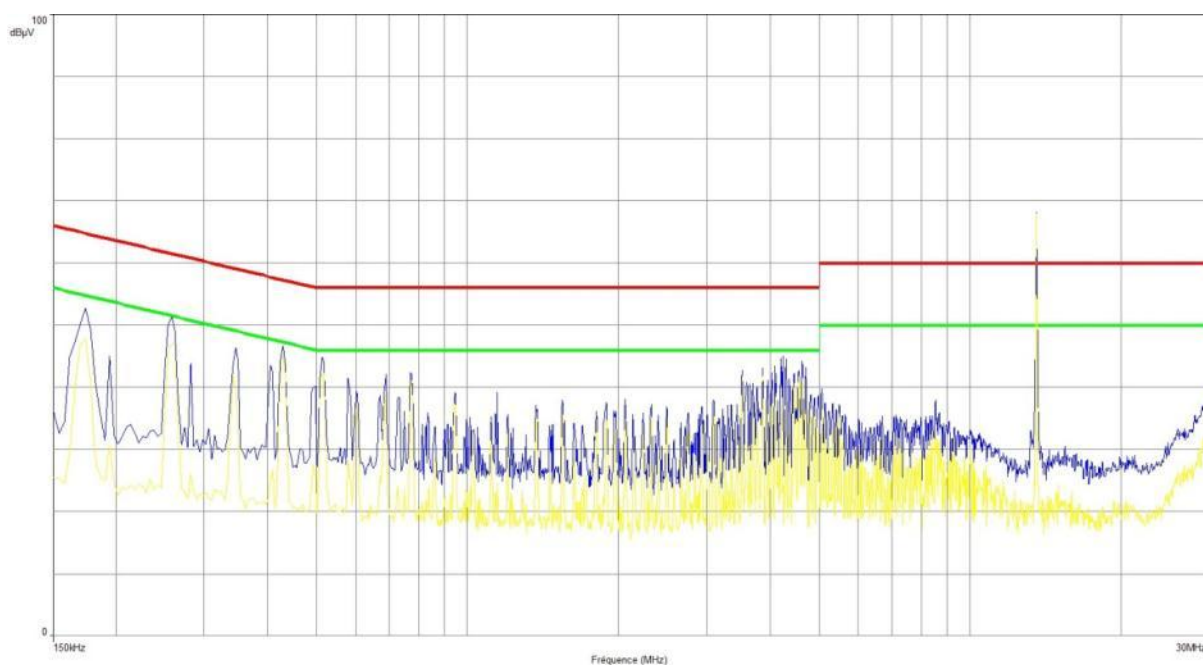
Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	MesAvg - LimAvg (dBµV)	QPeak (dBµV)	Lim QPeak (dBµV)	MesQP - LimQP (dBµV)
0.174	52.86	54.77	-1.9	52.63	64.77	-12.14
4.646	45.14	46	-0.86	45.58	56	-10.42
13.558*	70.25	50	20.25	68.69	60	8.69

*carrier frequency, see dummy load test



CONDUCTED EMISSIONS		
Graph name :	Emc#6	Test configuration:
Limit :	EN 55022	Tunnel - Traco (N)
Class :	B	

PARAMETERS			
Voltage / Frequency :	110VAC / 60Hz	Legend:	
Line :	Neutral	Peak Measure	Average Measure
RBW :	10kHz		
VBW :	30kHz	QPeak Limit	Average Limit
Frequency :	150kHz- 30MHz		



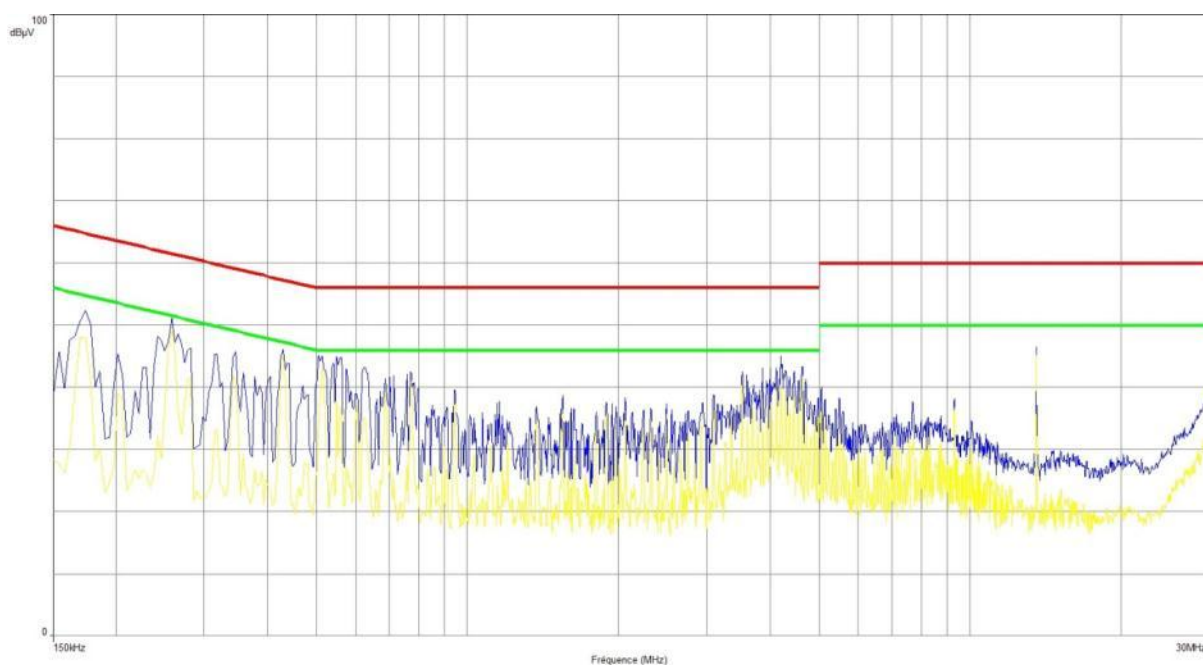
Frequency (MHz)	Avg (dBμV)	Lim Avg (dBμV)	MesAvg - LimAvg (dBμV)	QPeak (dBμV)	Lim QPeak (dBμV)	MesQP - LimQP (dBμV)
0.43	45.69	47.25	-1.57	45.25	57.25	-12.01
4.642	41.01	46	-4.99	40.78	56	-15.22
13.558*	70.43	50	20.43	68.83	60	8.83

*carrier frequency, see dummy load test



CONDUCTED EMISSIONS		
Graph name :	Emc#7	Test configuration:
Limit :	EN 55022	Tunnel - Traco - Dummy load (P)
Class :	B	

PARAMETERS			
Voltage / Frequency :	110VAC / 60Hz	Legend:	
Line :	Phase	Peak Measure	Average Measure
RBW :	10kHz		
VBW :	30kHz	QPeak Limit	Average Limit
Frequency :	150kHz- 30MHz		

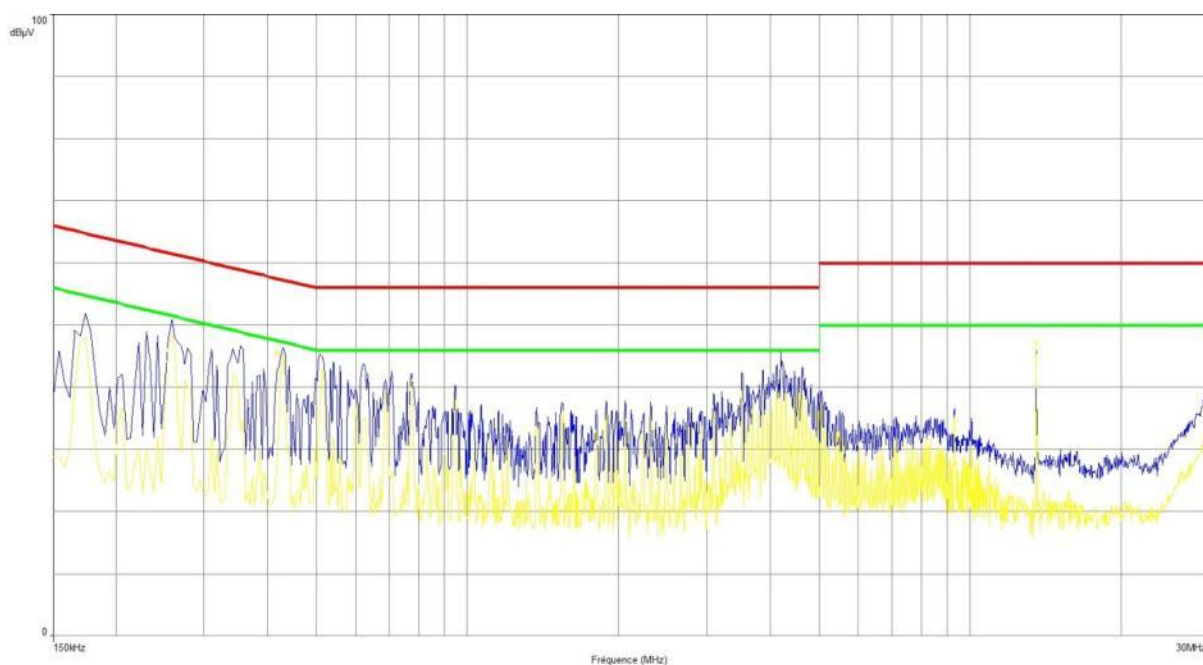


Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	MesAvg - LimAvg (dBµV)	QPeak (dBµV)	Lim QPeak (dBµV)	MesQP - LimQP (dBµV)
0.43	45.62	47.25	-1.64	45.33	57.25	-11.92
4.206	42.08	46	-3.92	42.08	56	-13.92
13.558	46.4	50	-3.6	45.12	60	-14.88



CONDUCTED EMISSIONS		
Graph name :	Emc#8	Test configuration:
Limit :	EN 55022	Tunnel - Traco - Dummy load (N)
Class :	B	

PARAMETERS			
Voltage / Frequency :	110VAC / 60Hz	Legend:	
Line :	Neutral	Peak Measure	Average Measure
RBW :	10kHz		
VBW :	30kHz	QPeak Limit	Average Limit
Frequency :	150kHz- 30MHz		

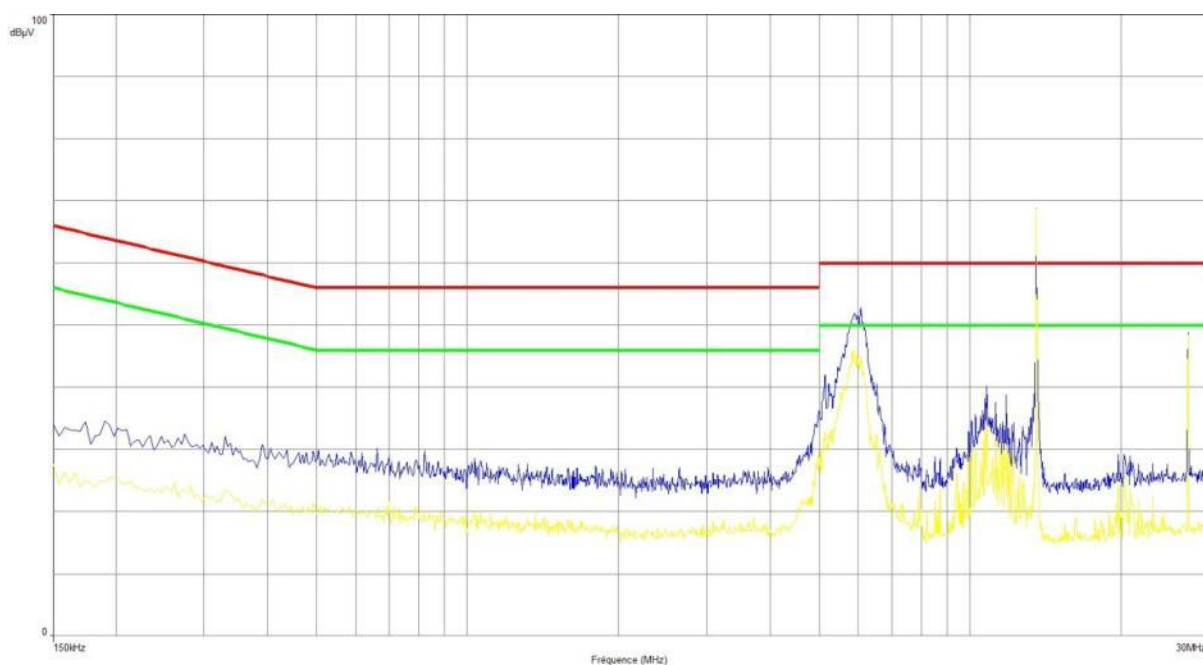


Frequency (MHz)	Avg (dBµV)	Lim Avg (dBµV)	MesAvg - LimAvg (dBµV)	QPeak (dBµV)	Lim QPeak (dBµV)	MesQP - LimQP (dBµV)
0.418	45.69	47.49	-1.8	45.33	57.49	-12.16
4.222	40.97	46	-5.03	41.64	56	-14.36
13.558	46.37	50	-3.63	45.02	60	-14.98



CONDUCTED EMISSIONS		
Graph name :	Emc#9	Test configuration:
Limit :	EN 55022	Tunnel - Schneider + Filtre (P)
Class :	B	

PARAMETERS		
Voltage / Frequency :	230VAC / 50Hz	Legend:
Line :	Phase 1	Peak Measure
RBW :	10kHz	Average Measure
VBW :	30kHz	QPeak Limit
Frequency :	150kHz- 30MHz	Average Limit

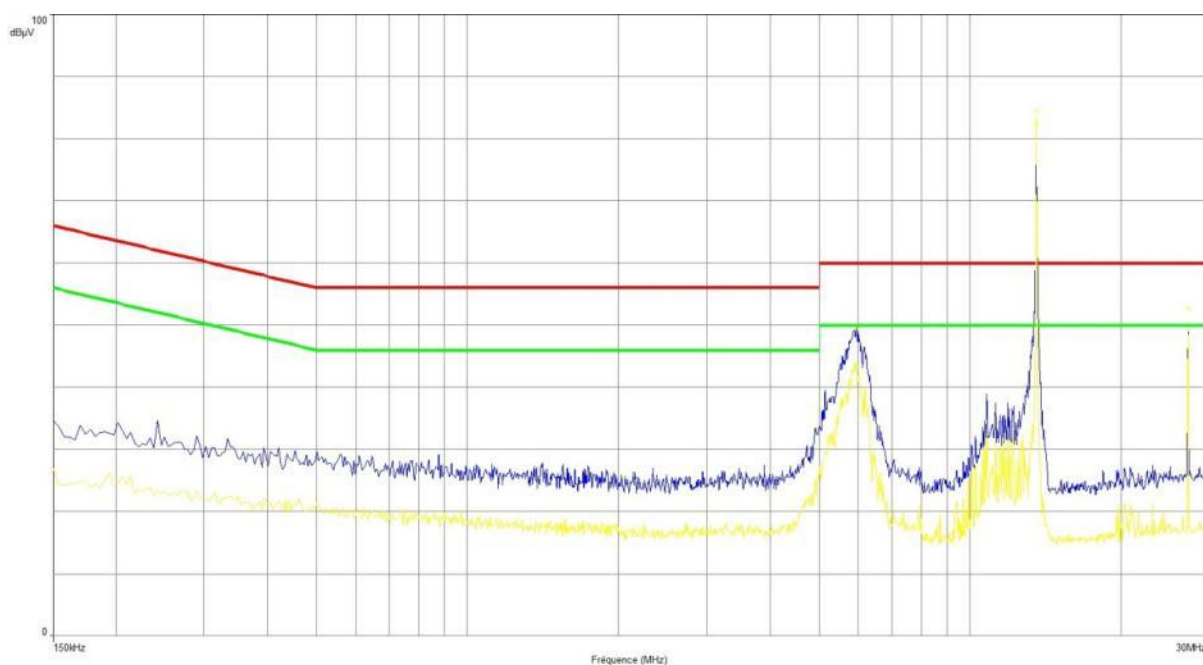


Frequency (MHz)	Mes.Avg (dBµV)	Lim.Avg (dBµV)	Mes.Avg-Lim.Avg (dB)	Mes.Q-Peak (dBµV)	Lim.Q-Peak (dBµV)	Mes.Q-Peak-Lim.Q-Peak (dB)
6.09	44.57	50	-5.43	45.45	60	-14.55
13.558	69.78	50	19.78	68.14	60	8.14
27.118	49.53	50	-0.47	46.38	60	-13.62



CONDUCTED EMISSIONS		
Graph name :	Emc#10	Test configuration:
Limit :	EN 55022	Tunnel - Schneider + Filtre (N)
Class :	B	

PARAMETERS		
Voltage / Frequency :	230VAC / 50Hz	Legend:
Line :	Neutre	Peak Measure
RBW :	10kHz	Average Measure
VBW :	30kHz	QPeak Limit
Frequency :	150kHz- 30MHz	Average Limit

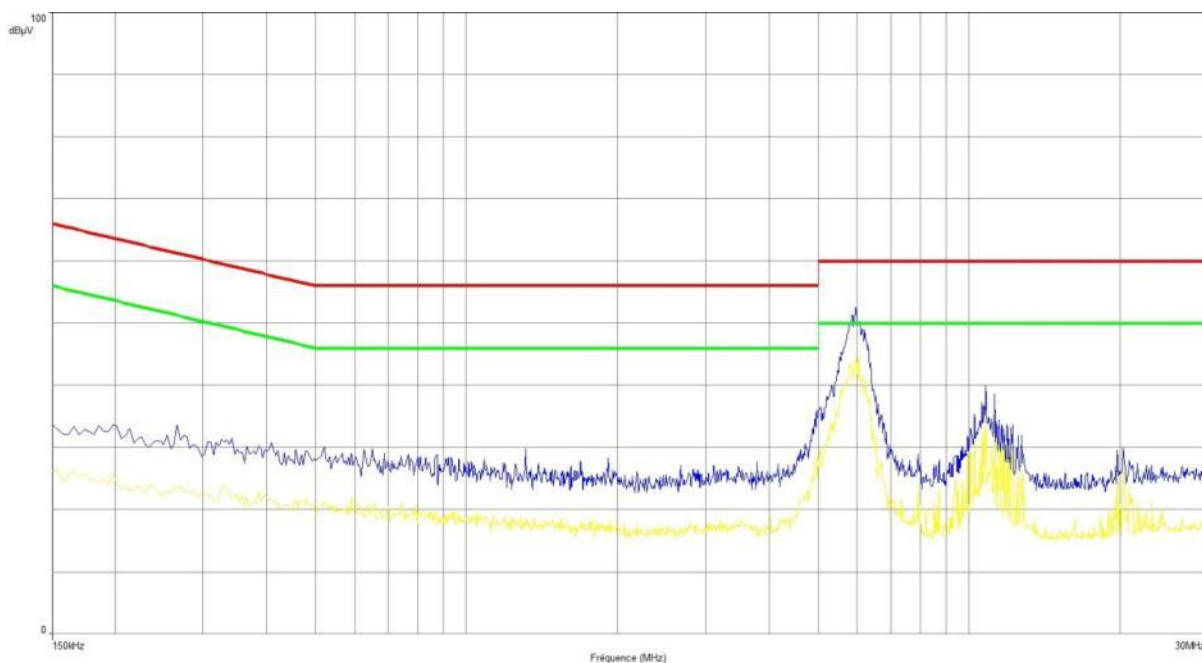


Frequency (MHz)	Mes.Avg (dBμV)	Lim.Avg (dBμV)	Mes.Avg-Lim.Avg (dB)	Mes.Q-Peak (dBμV)	Lim.Q-Peak (dBμV)	Mes.Q-Peak-Lim.Q-Peak (dB)
5.958	42.98	50	-7.02	43.43	60	-16.57
13.558	84.46	50	34.46	82.51	60	22.51
27.118	49.36	50	-0.64	46.21	60	-13.79



CONDUCTED EMISSIONS		
Graph name :	Emc#10	Test configuration:
Limit :	EN 55022	Tunnel - Schneider + Filtre - Dummy load (P)
Class :	B	

PARAMETERS		
Voltage / Frequency :	230VAC / 50Hz	Legend:
Line :	Phase 1	Peak Measure
RBW :	10kHz	Average Measure
VBW :	30kHz	QPeak Limit
Frequency :	150kHz- 30MHz	Average Limit

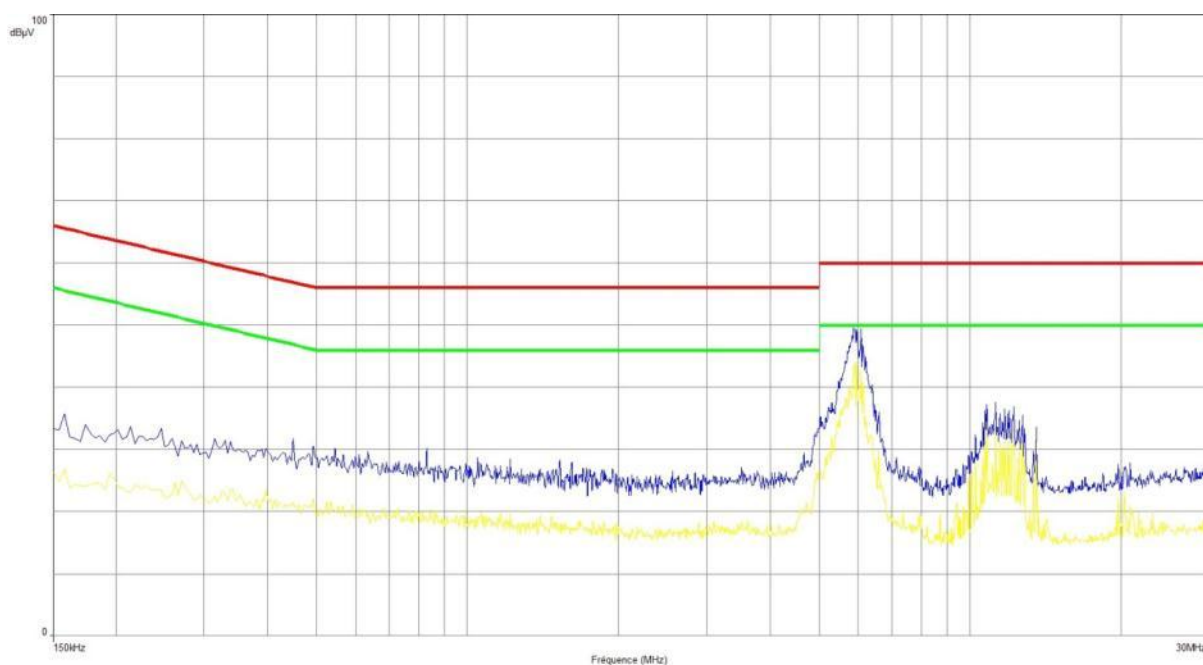


Frequency (MHz)	Mes.Avg (dBµV)	Lim.Avg (dBµV)	Mes.Avg-Lim.Avg (dB)	Mes.Q-Peak (dBµV)	Lim.Q-Peak (dBµV)	Mes.Q-Peak-Lim.Q-Peak (dB)
5.958	45.66	50	-4.34	46.58	60	-13.42



CONDUCTED EMISSIONS		
Graph name :	Emc#11	Test configuration:
Limit :	EN 55022	Tunnel - Schneider + Filtre - Dummy load (N)
Class :	B	

PARAMETERS		
Voltage / Frequency :	230VAC / 50Hz	Legend:
Line :	Neutre	Peak Measure
RBW :	10kHz	Average Measure
VBW :	30kHz	QPeak Limit
Frequency :	150kHz- 30MHz	Average Limit

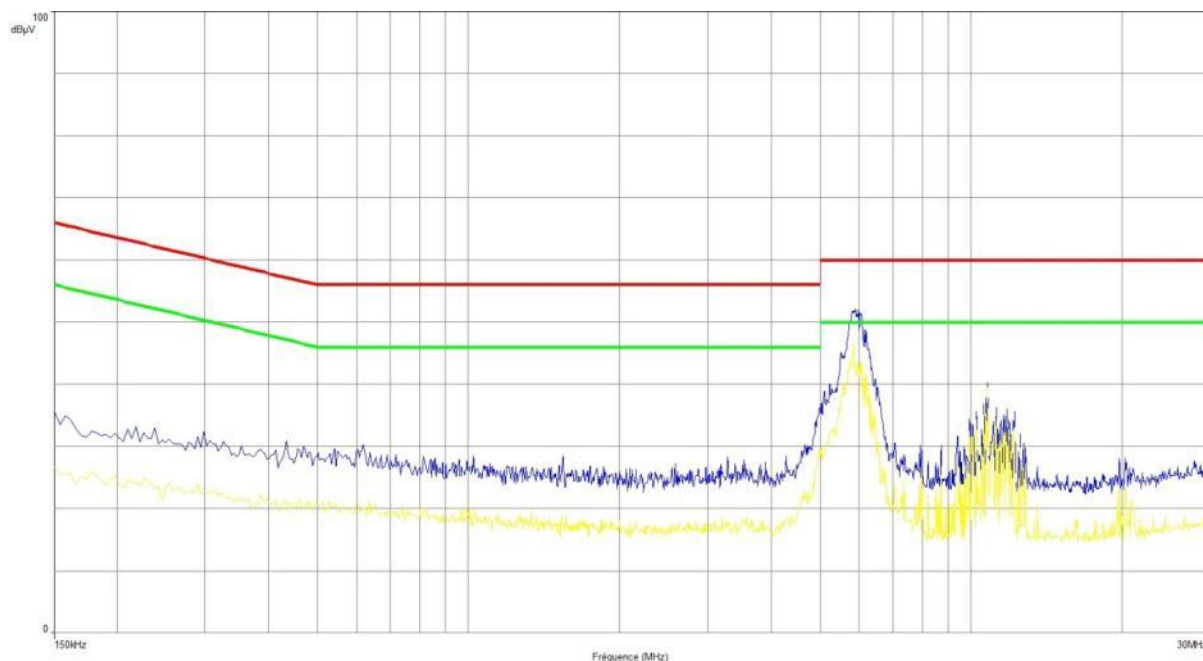


Frequency (MHz)	Mes.Avg (dBµV)	Lim.Avg (dBµV)	Mes.Avg-Lim.Avg (dB)	Mes.Q-Peak (dBµV)	Lim.Q-Peak (dBµV)	Mes.Q-Peak-Lim.Q-Peak (dB)
5.838	42.47	50	-7.53	42.89	60	-17.11



CONDUCTED EMISSIONS		
Graph name :	Emc#15	Test configuration:
Limit :	EN 55022	Tunnel - VPE + Filtre - Dummy load (P)
Class :	B	

PARAMETERS			
Voltage / Frequency :	230VAC / 50Hz	Legend:	
Line :	Phase 1	Peak Measure	Average Measure
RBW :	10kHz		
VBW :	30kHz	QPeak Limit	Average Limit
Frequency :	150kHz- 30MHz		

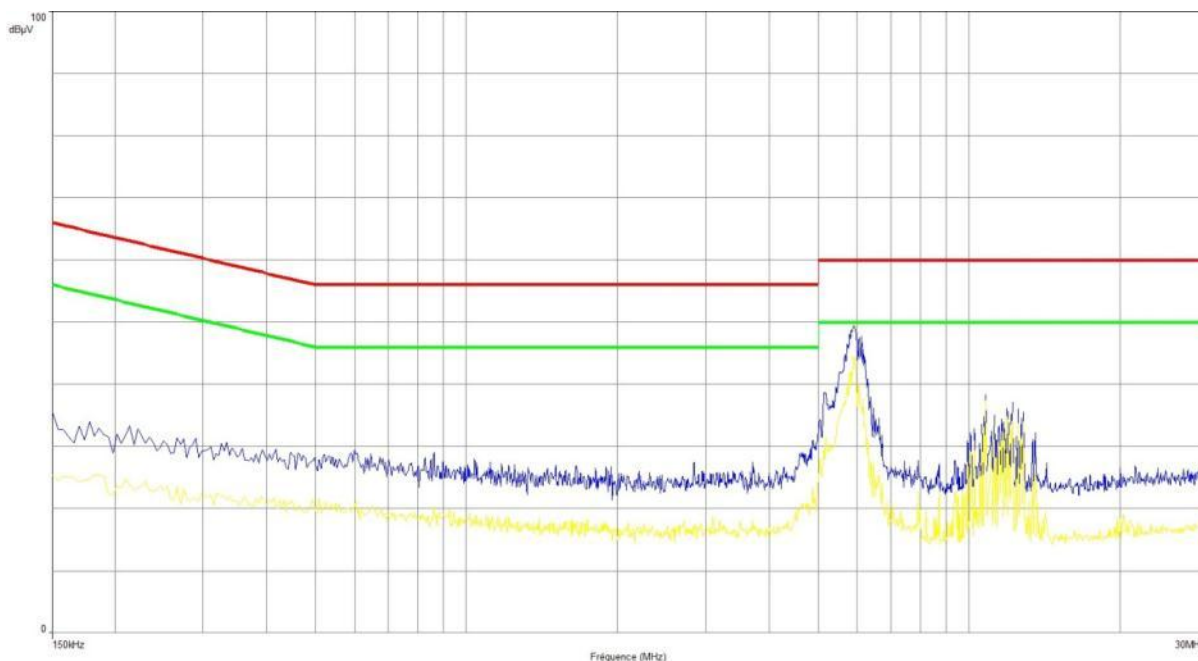


Frequency (MHz)	Mes.Avg (dBµV)	Lim.Avg (dBµV)	Mes.Avg-Lim.Avg (dB)	Mes.Q-Peak (dBµV)	Lim.Q-Peak (dBµV)	Mes.Q-Peak-Lim.Q-Peak (dB)
5.906	45.27	50	-4.73	46.98	60	-13.02



CONDUCTED EMISSIONS		
Graph name :	Emc#16	Test configuration:
Limit :	EN 55022	Tunnel - VPE + Filtre - Dummy load (N)
Class :	B	

PARAMETERS			
Voltage / Frequency :	230VAC / 50Hz	Legend:	
Line :	Neutre	Peak Measure	Average Measure
RBW :	10kHz		
VBW :	30kHz	QPeak Limit	Average Limit
Frequency :	150kHz- 30MHz		

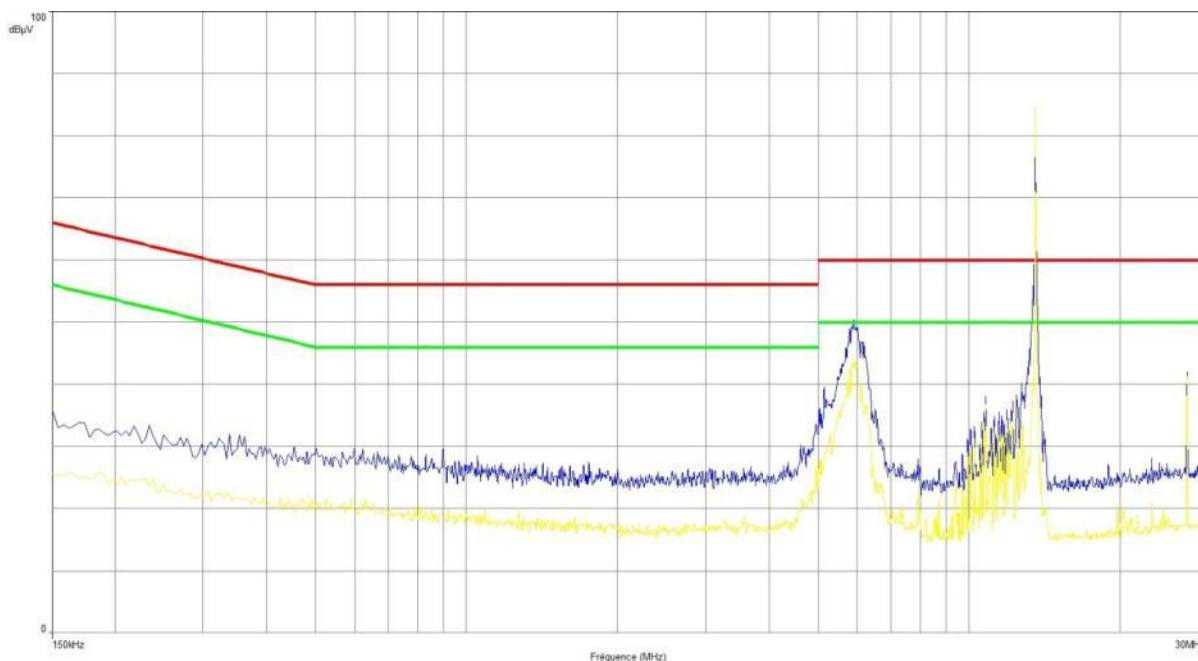


Frequency (MHz)	Mes.Avg (dBμV)	Lim.Avg (dBμV)	Mes.Avg-Lim.Avg (dB)	Mes.Q-Peak (dBμV)	Lim.Q-Peak (dBμV)	Mes.Q-Peak-Lim.Q-Peak (dB)
5.91	43.92	50	-6.08	44.11	60	-15.89



CONDUCTED EMISSIONS		
Graph name :	Emc#13	Test configuration:
Limit :	EN 55022	Tunnel - VPE + Filtre (P)
Class :	B	

PARAMETERS			
Voltage / Frequency :	230VAC / 50Hz	Legend:	
Line :	Phase 1	Peak Measure	Average Measure
RBW :	10kHz	QPeak Limit	Average Limit
VBW :	30kHz		
Frequency :	150kHz- 30MHz		

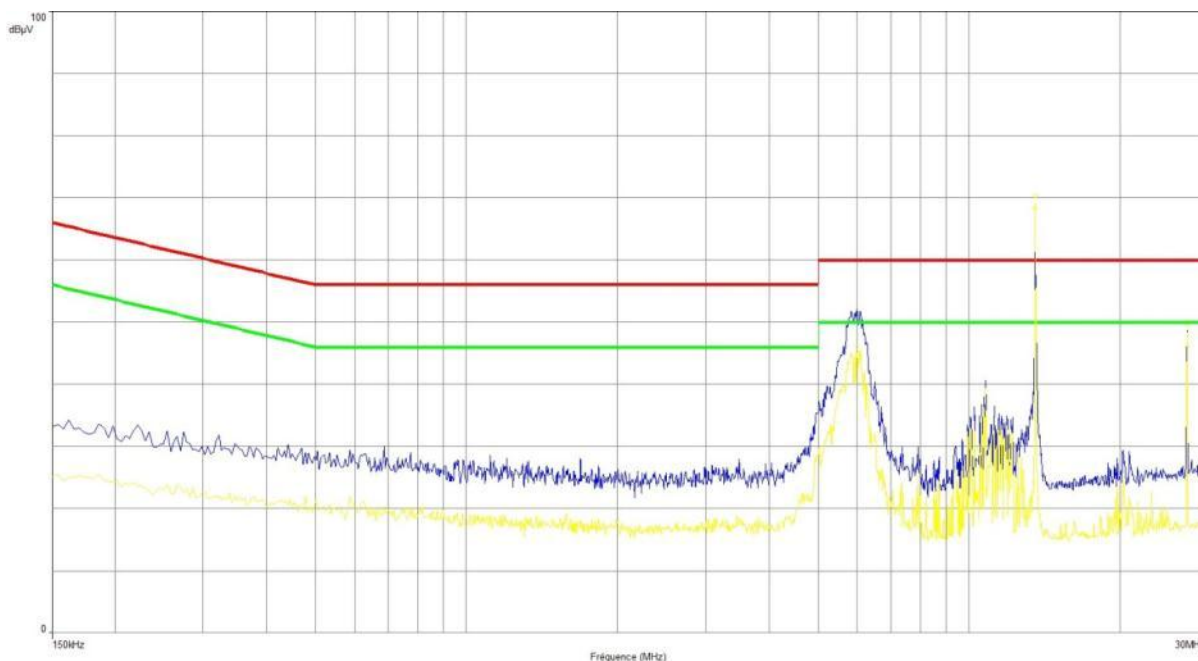


Frequency (MHz)	Mes.Avg (dBµV)	Lim.Avg (dBµV)	Mes.Avg-Lim.Avg (dB)	Mes.Q-Peak (dBµV)	Lim.Q-Peak (dBµV)	Mes.Q-Peak-Lim.Q-Peak (dB)
5.906	43.54	50	-6.46	44.78	60	-15.22
13.558	85.47	50	35.47	83.54	60	23.54
27.118	48.7	50	-1.3	45.44	60	-14.56



CONDUCTED EMISSIONS		
Graph name :	Emc#14	Test configuration:
Limit :	EN 55022	Tunnel - VPE + Filtre (N)
Class :	B	

PARAMETERS			
Voltage / Frequency :	230VAC / 50Hz	Legend:	
Line :	Neutre	Peak Measure	Average Measure
RBW :	10kHz		
VBW :	30kHz	QPeak Limit	Average Limit
Frequency :	150kHz- 30MHz		



Frequency (MHz)	Mes.Avg (dBμV)	Lim.Avg (dBμV)	Mes.Avg-Lim.Avg (dB)	Mes.Q-Peak (dBμV)	Lim.Q-Peak (dBμV)	Mes.Q-Peak-Lim.Q-Peak (dB)
5.998	43.51	50	-6.49	46.09	60	-13.91
13.558	70.22	50	20.22	68.4	60	8.4
27.118	49.66	50	-0.34	46.09	60	-13.91

**9. UNCERTAINTIES CHART**

Type de mesure / Kind of measurement	Incertitude élargie laboratoire / Wide uncertainty laboratory (k=2) ± x	Incertitude limite du CISPR / CISPR uncertainty limit ± y
Mesure des perturbations conduites en tension sur le réseau d'énergie <i>Measurement of conducted disturbances in voltage on the power port</i>	3.57 dB	3.6 dB
Mesure des perturbations conduites en tension sur le réseau de télécommunication <i>Measurement of conducted disturbances in voltage on the telecommunication port.</i>	3.28 dB	A l'étude / Under consid.
Mesure des perturbations discontinues conduites en tension <i>Measurement of discontinuous conducted disturbances in voltage</i>	3.47 dB	3.6 dB
Mesure des perturbations conduites en courant <i>Measurement of conducted disturbances in current</i>	2.90 dB	A l'étude / Under consid.
Mesure du champ électrique rayonné sur le site en espace libre de Moirans <i>Measurement of radiated electric field on the Moirans open area test site</i>	5.07 dB	5.2 dB

Les valeurs d'incertitudes calculées du laboratoire étant inférieures aux valeurs d'incertitudes limites établies par la norme, la conformité de l'échantillon est établie directement par les Peakx limites applicables. / The uncertainty values calculated by the laboratory are lower than limit uncertainty values defined by the standard. The conformity of the sample is directly established by the applicable limits values.